THE NATURE OF YOUNG CHILDREN'S UNDERSTANDING OF PRETENSE

By

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The present studies examined whether 3-year-old children understand that 1) pretense involves mental representations that contradict reality, and 2) that these representations are not taken to correspond seriously to reality.

In Experiment 1, young children's understanding of pretense was compared with that of two other mental representations that contradicted reality: memories and beliefs. Three- and 4-year-old subjects were presented with scenarios depicting a protagonist who held a mental representation that contradicted reality. Subjects were asked to choose one of two alternate thought pictures that depicted the mental state held by the story protagonist. One thought picture depicted the mental representation (correct answer), while the other depicted the real situation.

Three-year-olds' performance on the pretense and memory scenarios was significantly higher than performance on the false belief scenarios. Four-year-old children performed well on all three scenario types, with no significant differences in performance among any of the mental state scenarios.

In Experiment 2, 3- and 4-year-old subjects were presented with scenarios that depicted a story protagonist who was performing some action. In half the scenarios, the protagonist was depicted as pretending something, and in the other half he or she was depicted as "just doing something." Subjects were asked to judge the protagonist's true belief pertaining to the situation. As predicted, both 3- and 4-year-old subjects were significantly more likely to attribute a belief that corresponded to the situation in the nonpretense scenarios than in the pretense scenarios.

In Experiment 3, 3-year-old subjects were presented with two possible situations, and told that a story protagonist was pretending that one of these was the case. Following this, they were told that the protagonist was "all done pretending," and asked to predict his or her future (reality-oriented) action, by choosing an action that was either consistent or inconsistent with the pretend situation. While these subjects were not more likely to choose the correct action, they *were* more likely to choose the action that was inconsistent with their *memory* of the pretense situation.

Taken together, these studies suggest that 3-year-olds conceptualize pretending in terms of mental representations that are assumed to contradict reality.

CHAPTER 1
INTRODUCTION

The Issue

Children's ability to understand increasingly complex mental states in themselves and others is arguably one of the most important advancements in cognitive development during the early preschool years. The capacity to represent another person's mental representations has recently become a very popular topic of research in cognitive development, in part because of the impressive degree of abstract thought involved, but more importantly because of its critical importance for humans' everyday social and cognitive functioning. In order for children to be able to predict and explain actions of others, for example, they must understand that as humans we interpret and represent the world in our minds, and that these representations (such as beliefs about a situation) often determine how we will behave in that situation. Furthermore, the understanding that our representations sometimes misrepresent reality is an important component of our ability to learn from our mistakes.

Although there is some debate over this issue (e.g., Harris, 1991), most theorists view the development of children's understanding of mental states as theory-like (see Gopnick & Wellman, in press, for a justification of this view). That is, it is generally agreed that children's predictions and explanations of behavior are based on inferences made from a set of cohesive assumptions about the nature of mental states like desires, perceptions, and beliefs. These organized concepts are modified with development as children receive new information from their observations of and interactions with other people. This

set of assumptions has been referred to by researchers as a "theory-of-mind" (see Moses & Chandler, in press; Premack & Woodruff, 1978).

One aspect of this representational understanding that has become the hallmark subject of research in this area is young children's understanding of false belief, the knowledge that someone could hold a belief about something that is mistaken. In a typical false belief task (e.g., Wimmer & Perner, 1983), 3- to 4-year-old children are told a story about a protagonist who holds a mistaken belief about, for example, the location of an object. Subjects are told where the object really is, and are then asked to predict where the protagonist will look for the object. Most commonly, children at least four years of age make a correct prediction about where the protagonist is likely to look for the object, taking into account where the protagonist believes the object to be. Three-year-olds, on the other hand, typically respond that the protagonist will look for the object where they themselves know that it really is. Although some manipulations have resulted in improved performance by 3-year-olds (e.g., Chandler, Fritz & Hala, 1989; Fritz, 1991; Siegal & Beattie, 1991; Zaitchik, 1991), over a dozen studies have replicated Wimmer and Perner's original findings (e.g., Gopnick & Astington, 1988; Hogrefe, Wimmer, & Perner, 1986; Moses & Flavell, 1990; Moore, Harris, & Sapp, 1991; Peskin, 1991).

Although the specific nature of the developmental change in children's representational ability is still being debated, most agree that between the ages of three and four years children begin to understand that we hold mental representations about our world that are distinct from the world itself (see Flavell, Miller, & Miller, 1993, for an elaboration of this view). Thus, although 3-year-olds appear to understand that people do have internal mental states that relate or correspond to the world, such as desires and perceptions, only by about age 4 can they begin to conceive of two contradictory representations of reality,

as in a noncorrespondence between reality (as they represent it) and an alternate representation of it (Astington & Gopnick 1988; Flavell, 1988; Forguson & Gopnick, 1988). This understanding reflects an awareness of mental representations as being independent of the external world, and is illustrated by children's performance on false-belief tasks as well as appearance-reality tasks (e.g., Flavell, 1986; Flavell, Flavell, & Green, 1983), in which an object is made to appear to be one thing but is in reality another (for example, a candle that looks like an apple). In these tasks, 3-year-olds have difficulty responding that while something might look one way, it is really another. Most theorists consider this type of understanding to be a "metarepresentational" skill, in the recursive sense that the child must conceive of (or represent) a representation of a candle as an apple.

Given young children's difficulty with such contradictory representations, it is curious that children handle with ease what appear to be contradictory representations of a different sort, at a considerably younger age; this is evidenced by their natural propensity to engage in pretend play. Pretending that an object, such as a block, is a car arguably involves representing the reality (a block) in a contradictory way (as a car). Understanding pretend play of peers, then, would appear to require the ability to conceive of (or represent) the mental representation held by the pretender, while also having a representation of the external reality. As Forguson (1989) suggests, "The child's pretense behavior is interpretable as rational action only by attributing to her the capacity to form representations of her own and other's representations" (p. 54). This understanding is directly analogous to that required for successful performance on false belief tasks.

A study by Flavell, Flavell, & Green (1987) was the first to illustrate the puzzling discrepancy in children's understanding of these two mental

representations. They gave 3-year-olds standard appearance-reality tasks, where an object that looked like something else was presented (for example, a candle that looked like an apple). Children were asked the usual appearance question ("What does this look like right now?") and reality question ("Really and truly, what is this?"). Most 3-year-olds failed to recognize that something could appear to be one thing while at the same time really being something else, a finding that Flavell et al. attributed to their lack of representational understanding.

However, in another condition, children were presented with similar stimuli, but rather than asking them questions about the object's appearance, one of the experimenters overtly pretended the object was something else (for example, by pretending to bite into the candle that looked like an apple). Children were then asked a mental state question ("What is she pretending it is, right now?") and the reality question. In this condition 3-year-olds responded correctly that while the experimenter was pretending the object was one thing, it was really another (see also, Woolley, 1993, for similar findings with the mental representation of imagination, which was not accompanied by any overt action). The authors concluded that perhaps development of representational understanding begins with an understanding of mental states that are not considered serious representations of reality, and further, that "recognizing that one can represent something as both pretend X and really Y is probably the developmentally earliest form of the single object-multiple representations metaknowledge" (p. 822). (It should be noted that Flavell has more recently modified his view, in suggesting that pretense may be understood early on in terms of overt actions--see Flavell, 1988; Lillard & Flavell, 1992).

Several other theorists have proposed explanations for the fact that young children engage in and appear to understand pretense much earlier than they understand the representational nature of other mental states. In the section

that follows, the predominant views of young children's understanding of pretense and relevant empirical findings will be discussed.

Literature Review

Although for years many theorists have been interested in the representational capacity revealed in children's pretend play (e.g., Fein, 1981; Piaget, 1962; Vygotsky, 1966), Alan Leslie (1987; 1988) was the first to directly address the relation between pretense and theory of mind. Leslie regards children's understanding of pretense as providing important information about their representational ability. He proposes that infants begin with the ability to form literal, truthful representations of the world. He dubbs these "primary representations." During the second year of life, by the time a child begins to engage in pretend play, she has developed the capacity to form what Leslie calls "secondary representations," which are representations of primary representations. This ability enables a child to take a primary representation and "raise it" to another level, in order to make transformations of representations in a way that will not affect the primary representations themselves.

To illustrate with a concrete (and often cited) example, suppose a child is pretending that a banana is a telephone. Leslie (1987) argues that the child holds a primary representation of the banana as being a banana. He makes a copy of this representation (or represents the representation), and transforms it to conform to the pretend play situation, "This [banana] is a telephone." All resulting inferences about what one does with a telephone, then, can be applied to this secondary representation, while still preserving the integrity of the primary representation.

Leslie (1987; 1988) contends that the problem for children on false belief tasks is <u>not</u> in representing two contradictory models of reality. After all, he

suggests, this is exactly what children are doing when they pretend. Pretense, then, according to Leslie, involves the metarepresentational skill of "representing a representation" of reality, as being different from reality. By his account, then, the pretender herself is exercising a metarepresentational skill, in holding a representation of reality, and representing that representation itself as something else. Leslie further argues that the ability to understand pretense in others involves the same metarepresentational skill as does pretending, and the two emerge simultaneously.

The model as outlined thus far leaves unexplained the reason that young children who are capable of understanding pretense have much more difficulty understanding false beliefs. Leslie (1988) has suggested that the difficulty children have on false belief tasks lies in realizing that mental states can be both "the effect and the cause of things that are concrete and material" (p. 32). That is, younger children do not understand that a mental state can be caused by something external (such as an object or state of affairs that is perceived directly), nor do they understand that a mental state can cause something (such as a behavior). After this insight comes the second problem of inferring what mental state was caused and what behavior will result. Thus, Leslie argues, these are the main developments that take place between the ages of 3 and 4, that are responsible for children's performance on both false belief tasks and also appearance-reality tasks.

The reason that understanding of pretense is acquired so much earlier, according to Leslie (1988), is because these problems do not exist; it is usually fairly obvious from a person's behavior whether they are pretending and what they are pretending. Furthermore, the child does not have to understand that the pretend mental state was caused by something external (as a false belief is),

because pretense is more arbitrary, and not necessarily caused by anything real (see also Searle, 1983; Woolley & Wellman, 1993 on this distinction).

While this theory appears to offer a plausible explanation of the type of representational ability that develops, the explanation that Leslie (1987; 1988) proposed for young children's failures on false belief tasks has not been supported by empirical evidence. For example, according to Leslie's proposal, children should be no more likely to correctly predict a protagonist's action based on their knowledge of what the protagonist is pretending, than based on knowledge of the protagonist's belief, because either would involve predicting an action from a mental state. Peskin (1991), however, found evidence to the contrary. She showed 3-year-olds where a puppet had hidden a treasure, and had subsequently erased his inky tracks and had made new tracks to another location. In the deception condition, the other character in the story did not know that the tracks did not really lead to the treasure. In the pretense condition, the character was told where the treasure was really hidden, but had agreed to pretend that the treasure was at the end of the false tracks. With this in mind, subjects in both conditions were asked two questions: 1) "Where will the character look for the treasure?" and 2) "Where does the character think the treasure is?"

Children in the pretense condition were significantly more likely to make a correct response to both the "look" and the "think" questions. This finding suggests, contrary to Leslie's (1987; 1988) claim, that young children can predict actions from some mental states but not others. Furthermore, it also suggests that 3-year-olds, at least in this situation, can conceive of two apparently contradictory mental representations, even when held by the same person; that is, they realize that a person can pretend a treasure is in one location while at the same time knowing it is in another.

Although this study appears to shed light on the issue of representational ability, it is not without its limitations. For example, because the protagonist in the pretense condition was told where the treasure was really located, subjects may have found it easier than usual to attribute a correct belief to him (he actually knows where it is). A related point is that a correct response to the belief question in the pretense condition is *congruent* with reality, whereas a correct response to the same question in the deception condition requires an understanding of a belief that is *incongruent* with reality. Thus, it is possible that subjects were basing their responses on the reality without a true understanding of belief. Nevertheless, they did predict in the pretense condition that the protagonist would look in the false location while believing the treasure is in the true location, a seemingly advanced response. However, another potential confound in this study is that subjects were told that the protagonist agreed to "pretend that the treasure is at the end of the false tracks." In essence, then, subjects were told where the protagonist would look for the treasure. Accordingly, children might have responded correctly to the "look" question without actually having an understanding of the representational nature of pretense. Thus, although Peskin's (1991) study appears to refute Leslie's hypothesis about the critical developmental change between three and four years of age (Leslie, 1987; 1988), conclusions remain limited.

Other researchers, however (e.g., Fritz, 1991; Wellman & Bartsch, 1988; Zaitchik, 1991) have also found evidence against Leslie's claim that children's difficulty on false belief tasks lies in making an action prediction based on knowledge of a mental state. These researchers have found that when the reality is made less salient or unknown to the subjects, 3-year-olds can in fact make correct action predictions of a protagonist based on mental state knowledge. It should be pointed out that Leslie, 1991, has recanted his original claim, although

he has not yet offered an alternative explanation for the age discrepancy found in pretense and false belief understanding.

Peskin's study (1991), though, is important in being the first to examine children's understanding of an important aspect of mental representation in pretense: namely, the pretender does not actually believe what she is pretending. That is, the pretender holds a mental model or "serious" representation of reality, as well as an alternate, "nonserious" pretense representation of reality. Furthermore, she realizes that the pretense model is not meant as a serious reflection of reality. On the contrary; she is intentionally distorting reality in her pretense model. This realization is what distinguishes "knowingly acting-as-if" (pretense) from "unknowingly acting-as-if" (false belief). It is suggested here that 3-year-olds understand this realization on the part of the pretender and, further, that this is the critical distinguishing factor that allows children to understand pretense before false belief.

In support of this suggestion, Woolley and Wellman (1993) found that 3-year-olds more often responded that a protagonist believed her mental state when that mental state was knowledge rather than imagination (this study will be described in more detail later). These studies together, then, suggest that young children do comprehend the distinction between representational attitudes of conviction (such as belief) and representational attitudes of nonconviction (such as pretense). Study 2 will directly assess this understanding, in an effort to improve upon the methodological difficulties identified in Peskin (1991).

A different view of the relationship between pretense and false belief understanding is put forth by Josef Perner (1988; 1991). In Perner's model of representational development, he proposes that an infant begins with a "single updating model" of the world. The object of all thoughts and actions during this period is the present reality. When the child is about 18 months old, according

to Perner, she develops the capability to form "multiple models." These models can represent the world as different from the way it really is, right now. For example, alternate models might be developed that represent past situations. In addition, this ability enables the child to consider hypothetical alternatives to the current situation. Thus, the child now has the capacity for pretend play. In contrast to Leslie, Perner argues that there is no need to posit "secondary representations" in referring to these alternate representations. They are not representations *of* representations, but just representations of hypothetical alternative situations.

Perner, then, disagrees with Leslie that pretense requires any metarepresentational ability. He suggests that pretense models are similar to models of past reality. Neither type of model requires metarepresentational ability, according to Perner, "since understanding temporal change evidently does not imply that the present needs to be seen as representing the past, as an object used in pretense need not represent what it is pretended to be" (1988, p. 44).

Perner (1991) suggests that a representation, by definition, represents something (the referent situation) *as being a certain way* (the sense). In order to be capable of metarepresentation, then, a child must be able to understand both components of representation. To illustrate, in the case of belief, a child must understand that, for example, her sister represents her doll (referent) as being in the toybox (sense). The case of pretense is slightly more confusing, however. In this case it is the *hypothetical* (referent) situation that is represented as being a certain way. It is more difficult, then, to distinguish the representation (sense) from the (referent) situation. In fact, Perner argues, people often regard the hypothetical situation itself as the representation (rather than the referent), and this blurring of the distinction is the basis for confusion about pretense.

Assuming this depiction of pretense representation is accurate, the problem of how children *understand* pretense in others remains to be addressed. It could be argued (and in fact, it is suggested here) that while pretending in itself might possibly be explained by reference to alternate mental models of reality, *understanding* pretense would nonetheless seem to require "conceiving of" (or representing) the alternative mental models formed by the pretender, as well as understanding the (nonconvictional) representational relationship between the pretense representation and the representational content-- in other words, metarepresentation.

Perner (1991) addresses this issue by suggesting that 3-year-old children understand pretense only in terms of "acting-as-if" a situation exists, when in fact it does not. Thus, in watching someone pretend that a banana is a telephone, a young observer forms the hypothetical model, "That [banana] is a telephone" and simply views the pretender as acting in accordance with this alternate mental model. Stated differently, young children are able to understand pretense by referring to the representational *referent*, but without necessarily understanding the pretender's representation (sense) of that situation (for example, the fact that it is a nonserious representation).

To clarify, the explanation that Perner (1991) proposes for children's understanding of pretense is similar to the premise for using the false belief task as a litmus test for children's understanding of belief in general: In the latter case, if the belief is congruent with reality, then children's correct judgments about the belief and/or resulting action might simply be based on their understanding of the (referent) situation, with no need to consider the belief (representational sense). Similarly, according to Perner, because in pretense the representation is not a representation of the true situation but is instead a representation of a nonexistent, hypothetical situation, there is no contradiction

between the situation and the pretender's representation of it. Therefore, a child could presumably understand pretense by reference to the hypothetical situation (referent) only.

Thus, Perner has called children at this age "situation theorists," who "conceive of thinking not as a representational activity but as a preoccupation with the thought-about situation" (1991, p. 10). (In the case of pretense, the "thought-about" situation is a hypothetical one.) This limitation, according to Perner, accounts for the age discrepancy in children's understanding of pretense and false belief. In order to understand false belief, a child must understand thought as involving a representation (sense) that might not be congruent with the situation thought about (referent).

While the present view is not in disagreement with Perner's (1991) argument that pretense need not involve "representing a representation," some distinctions should be made. In contrast to Perner, the argument proposed here is that a pretense representation is not simply a representation of a hypothetical situation, but is instead a representation of reality. A child does not pretend that a hypothetical telephone is a telephone, but that a (real) banana is a telephone. Thus, pretense (like false belief) does involve forming a contradictory mental representation of reality. However, in this case the representation is not taken as an accurate reflection of reality. Thus, there is no conflict between the referent (banana) and the sense (telephone), as there is in the case of false belief. This is why children are able to understand pretense earlier, according to the present view. Furthermore, young children must understand something about the representational relationship in pretense (i.e., that it is not taken to be veridical, or correspond to the actual situation), in order to avoid confusion when they observe pretense actions. The studies presented here allowed for a

test of these arguments, based on different predicted response patterns. These predictions will be discussed in a later section.

Lillard (1993a; 1993b; Lillard & Flavell, 1992) has recently developed an alternative explanation for children's apparently precocious understanding of pretense and how it relates to representational ability in other domains. As the present series of studies have direct implications for this proposal, Lillard's work will be discussed in detail. She suggests that 3-year-olds are unable to conceive of any mental representation that is incongruent with a specific real-world referent, regardless of whether the representation is seriously taken to reflect the true state of affairs. According to Lillard, while young children may appear to reveal this understanding in pretense situations, they do not actually understand the representational nature of pretense at all, but begin with an understanding of pretense only in terms of overt behaviors, for example, as "acting-as-if" (that is, young children view action as the "defining" rather than "characteristic" feature of pretense). Thus, Lillard's view is similar to that of Perner (1991), in denying in young children any understanding of the representational aspects of pretense.

In two studies that have some bearing on this issue, Lillard and Flavell (1992) presented 3-year-old subjects with information regarding a story protagonist's mental representation, followed by contradictory information about the reality. Following this, subjects were simply asked what mental state was held by the protagonist and what the real situation was. For example, children were shown a doll and told that the doll was pretending that there was juice in a cupboard. Following this, the cupboard was opened to reveal a teddy bear. Children were then asked a forced-choice reality question ("What's really in the cupboard, a teddy bear or juice?") and a mental state question ("What's she pretending is in the cupboard, a teddy bear or juice?").

Subjects were tested on various mental states, including pretense, false belief, and desire (which is assumed to be understood nonrepresentationally). Results of this study revealed that 3-year-olds more often attributed the correct mental state on "desire" trials than on pretense or false belief trials. In addition, performance on pretense trials exceeded that of false belief trials.

It should be noted that this pattern of performance would be expected if, as suggested here, young children have difficulty only with "serious" mental representations that contradict reality. However, Lillard and Flavell (1992) suggested that perhaps these children were conceptualizing pretense (as well as desire) nonrepresentationally. In fact, in all pretense scenarios the protagonist was depicted as performing some action that was related to the pretense situation (for example, getting a cup for the juice). Thus, the authors suggested that subjects were possibly relying on behavioral cues to respond correctly that the protagonist was pretending that juice was in the cupboard.

In order to test this possibility, a second study was conducted, which included the three mental states of pretense, false belief and desire. In half the scenarios, the mental state was accompanied by overt actions, while in the other half they were not. Subjects were found to respond correctly to the pretense scenarios significantly more often when the protagonist was engaging in an overt action. This action/ nonaction variable had no effect on performance of the other two scenario types. Lillard and Flavell (1992) concluded that perhaps children at first conceive of pretense nonrepresentationally; that is, they do not understand the mental state underlying pretense but instead view it solely in terms of external behaviors.

While this study appears to lend support to Lillard's proposal (e.g., Lillard, 1993a), it is possible that children found it difficult to regard the protagonist as pretending, when she was not engaged in any pretense-relevant overt actions. In

one nonaction scenario, for example, subjects were told, "See this girl? She's pretending that there is juice in that cupboard." The protagonist was sitting on a rug in the next room at the time, not doing anything that might suggest that she was engaged in pretense. It is proposed here that children might actually understand mental states underlying pretense, but only if it is obvious to them that someone is pretending. After all, the most common manifestations of pretense, especially in young children, involve acting something out.

Findings of Gopnick and Slaughter (1991) lend support to this suggestion. They were interested in looking at young children's understanding of changes in their own mental states, such as past versus present beliefs, desires, and pretenses. The pretense task involved having children pretend an object was one thing, and later having them pretend it was something else. Children were then asked about the present and past pretenses. In Experiment 2, 3-year-olds were found to be able to correctly answer the past and present pretense questions--even when the pretense action was exactly the same. For example, children first pretended that an empty cup contained juice, and later pretended the same cup contained hot chocolate. The authors reported that none of the children acted differently towards the cup in the two situations (such as by "blowing" on the hot chocolate), but instead held the cup to their mouths and pretended to drink in both cases. Nevertheless, children were able to distinguish past from present pretense situations, in spite of the fact that it was only the mental state (and not the action) that had changed (see also Flavell, Flavell, & Green, 1987; Freeman, 1992). In an analogous belief task, the same children were unable to accurately report their own past beliefs that had changed (thus making them false beliefs). This finding not only lends support to the argument that young children do indeed understand the mental states in pretense, but also that perhaps it is the

seriousness with which the mental state is taken to correspond to reality (i.e., its veridical nature) that prevents them from conceptualizing false beliefs.

More recently, Lillard (1993b) conducted four additional studies that more directly examined the question of whether young children understand mental representations in pretense. Specifically, she proposed that if they do have this understanding, then they should realize that certain content-relevant knowledge is required in order to pretend.

In the first experiment, Lillard (1993b) presented 4- and 5-year-old subjects with various scenarios that depicted a protagonist who was pretending something. For example, in one task, children were told, "George knows what a rabbit is. He's pretending that he's a rabbit." With this statement, George was manipulated to hop up and down. Following this, another story protagonist was introduced, and made to move the same way George had moved. Subjects were told, "Moe doesn't know what a rabbit is. He's never seen a rabbit, and he hasn't heard of one either. He's hopping up and down like this." Following a memory control question about the state of Moe's knowledge about rabbits, subjects were asked the test question, as follows: "Is Moe pretending that he's a rabbit?"

Lillard found that performance of 4- and 5-year-olds was poor (22% correct and 44% correct, respectively). Thus, children tended to respond that Moe was pretending to be a rabbit, even though Moe did not know what a rabbit was.

Another variable that was included in this study was the type of response required (either yes/no or forced choice). Subjects in this study responded better when given a forced choice (e.g., "Is Moe pretending to be a rabbit or is he just hopping up and down?"), than when a yes or no response was required. Therefore, in a second study, subjects were presented with the same type of task, with the following changes: When the first protagonist was presented, he was

described as hopping up and down, pretending to be a rabbit. Following presentation of the second protagonist, subjects were asked whether he was pretending to be a rabbit or just hopping up and down. In this study, performance increased substantially (67% correct and 86% correct responses from 4- and 5-year-olds, respectively).

However, Lillard suggested that one potential problem in this study was that the action "hopping up and down" was referred to twice (to describe the actions of both protagonists), while "pretending" was only referred to once (to describe protagonist #1). Therefore, correct performance could have been due to a simple response strategy rather than based on a true understanding of this representational aspect of pretense.

Lillard also acknowledged that performance difficulties in Study 1 might be attributable to an "analogy" strategy (e.g., "George is hopping, and George is pretending. Moe is hopping, therefore Moe is also pretending."). Thus, two additional studies were conducted, where no initial story protagonist was ever presented. Instead, subjects were simply told, "Moe doesn't know anything about rabbits" (Study 3), or "Moe doesn't know that rabbits hop like that" (Study 4). Following this, they were told, "Moe is hopping like a rabbit." Subjects were then asked whether Moe was "pretending to be a rabbit or just hopping." Performance on both Studies 3 and 4 was similar to the low performance found in Study 1. Thus, Lillard concluded that children do not understand that certain content relevant knowledge is required in order to pretend, but instead equate pretending with "acting-as-if." In fact, based on these results, Lillard has suggested that they develop understanding of false belief *before* they acquire a representational understanding of pretense. This latter type of understanding apparently is not revealed until around age 6, according to Lillard.

However, another explanation for the low performance in Experiments 3 and 4 is possible. Specifically, the fact that Moe was depicted as hopping "like a rabbit" may have led children to rely on something like a matching strategy (similar to Study 1). For example, "hopping like a rabbit" might have appeared to be more closely related to the description "pretending to be a rabbit" than "just hopping." Indeed, Study 1 indicated that, when presented with this type of information, children this age might be relying on other cues to make judgments about whether the protagonist was pretending.

Nevertheless, Lillard (1993b) has suggested that these studies conclusively revealed that young children do not have understanding of the types of content-knowledge required to pretend. However, even if this conclusion is made, it should not be taken to imply that children fail to conceptualize pretense as involving mental representations at all, but understand it only in terms of overt actions. It would seem highly counterintuitive that young children do not have any understanding, for example, of the fact that a pretender does not truly believe what she is pretending. It is suggested that a more direct assessment of children's understanding of mental representations in pretense is in order. The purpose of the present studies, described later, was to provide such an assessment.

In an interesting alternative account of the development of representational ability, Wellman (1990) disagrees with the generally held assumption that only by passing the standard false belief task can children reveal metarepresentational understanding. In commenting on 3-year-olds' performance on typical false belief tasks, he states, "I believe that while this result shows a peculiar difficulty that young children have with false beliefs, it does not indicate a lack of understanding of beliefs altogether. That is, young

children understand belief in spite of misunderstanding false beliefs" (1990, p. 24).

In Wellman's (1990) analysis of the development of representational ability, then, he argues that even young children are capable of understanding certain aspects of mental representations. Wellman and his colleagues (e.g., Estes, Wellman, & Woolley, 1989; Wellman & Bartsch, 1988; Wellman & Estes, 1986; Woolley & Wellman, 1993) have provided rather convincing evidence in support of this argument. For example, Wellman and Estes (1986) found that 3-year-old children understood the ontological distinction between both fictional and reality-oriented mental representations and their referents (in responding, for example, that a person can eat a cookie but not eat a thought of a cookie). Thus, they are able to distinguish mental representations from their referents. Estes, Wellman, and Woolley (1989), furthermore, found that children this age used descriptions of mental representations that depicted their representational quality (e.g., "It's like a picture in my head.").

Wellman (1990) further proposes that 3-year-olds are actually capable of understanding certain types of misrepresentation. Specifically, he suggests that children at this age have a "copy" theory of reality-oriented mental representations (he borrows the term from Chandler & Boyes, 1982). That is, they expect mental representations of conviction (such as beliefs) to accurately depict the reality. They do, however, have a limited understanding that sometimes these mental representations can "miss their mark," according to Wellman (1990). This could occur if a representation either fails to represent the referent at all, or it only partially represents the referent.

To illustrate, Wellman (1990) cites evidence (Hogrefe, Wimmer, & Perner, 1986) that young children can understand that a story protagonist might not know something, if he is not privy to the information necessary to form the

mental representation (i.e., failure to represent). Further, Wellman and Bartsch (1988) found, for example, that when 3-year-olds were presented with information that there was a banana located in each of two locations, but that the protagonist only was aware of one of the locations, they were able to correctly predict where the protagonist would look for the banana (i.e., partial representation).

Thus, it appears that even very young children do understand certain aspects of mental representations. In an especially convincing task, Wellman and Bartsch (1988) found that children this age were able to correctly predict a story protagonist's action based on his belief about a situation, even when the belief differed from their own (and when the reality was not evident).

It should be noted that Perner (1991) has suggested that children's performance in these studies can be explained in terms of a simple association strategy. That is, in cases where the reality is not evident (as it is in standard false belief tasks), the child will search for some association between the protagonist and the referent situation in making a judgment about the protagonist's belief and/or action. In this situation, then, 3-year-olds might simply view the protagonist as being "associated" with the location, and thus respond correctly without a true understanding of representations. However, Wellman and Bartsch (1988) controlled for this possibility in other studies (for example, by associating the protagonist with more than one location) and found the same results. These findings, then, contradict widely-held theoretical views (e.g., Astington & Gopnick, 1988; Flavell, 1988; Forguson & Gopnick, 1988; Perner, 1991) that the difficulty young children have on false belief tasks is in understanding that a single referent can give rise to two contradictory mental representations. Instead, these findings suggest that young children fail to

understand that mental states of conviction (such as beliefs) might contradict reality (see also Rakowitz, 1991).

It should be noted that Flavell, Green and Flavell (1989) have found that 3-year-olds fail to understand that another person's visual perspective might differ from their own. This finding would appear to contradict Wellman and Bartsch (1988). However, one important difference in this type of task is that the subject's own view or perspective accurately reflects the reality (at least in their mind), so another view necessarily misrepresents reality (a concept they cannot yet grasp). In the case of belief, on the other hand (as in the Wellman & Bartsch, 1988 tasks) the subject presumably realizes that she does not know whether her belief is correct.

Wellman's theory (Wellman, 1990) is congruent with these findings. He argues that in spite of young children's ability to understand certain cases of misrepresentation, they do not yet understand the interpretive nature of mental representations because they view reality-oriented representations as "copies" of their referents. This interpretive understanding is necessary to realize that mental representations sometimes misrepresent reality, and young children's failures in the area account for poor performance on standard false belief tasks, according to Wellman. Thus, 3-year-olds are capable of understanding that another person's belief might differ from their own, because in this case there is no (known) contradiction between the mental representation and its referent.

Woolley (1993; Woolley & Wellman, 1993) has further argued that, in fact, the truth value of a mental representation (that is, whether or not it is taken to correspond to reality) is an important determinant of whether young children will be able to understand a contradiction with reality. She contends that this aspect of mental representation has been largely ignored in research on children's understanding of beliefs. In her dissertation, Woolley examined

(among other things) whether young children are sensitive to this distinction. She found that even young 3-year-olds more often responded that a story protagonist believed her mental representation to accurately correspond to reality when she was depicted as knowing what was in a box, than when she was depicted as imagining something in a box. However, only older 3-year-olds consistently responded that a protagonist does not believe her representation to reflect reality in the case of imagination.

These results suggest that 3-year-olds do have some understanding of certain mental representational relationships. However, it could be argued that in the case of imagination, there is no specific referent that contradicts the mental state (in Perner's terms, it involves a sense but no referent), so understanding of representational relationships is not required for correct performance on these tasks.

Lillard (1993a) has distinguished pretense from imagination in a similar way. She argues that in pretense there are five components: 1) a pretender; 2) a reality; 3) a representation that differs from reality; 4) a "layering" of the representation over the reality so that they both exist within the same space and time; and 5) an awareness on the part of the pretender of the previous components. In contrast, imagination only involves the following components: 1) an imaginer; 3) a mental representation; and 5) an awareness that the mental representation differs from reality. There is no need to posit a "layering" of the representation over a specific referent, which is the essence of representation in Perner's view. The point here is that while Woolley and Wellman's studies were important in distinguishing mental representations based on truth value, and revealing that young children are capable of understanding this distinction, a more stringent test of the argument that 3-year-olds' metarepresentational difficulty lies in understanding reality-oriented mental representations that

contradict reality would involve examination of children's understanding of pretense.

Aside from Lillard's studies (Lillard, 1993b) and the present series of studies, very few investigations of pretense understanding have been conducted. Harris and Kavanaugh (1993), for example, conducted a series of experiments that investigated young children's understanding of certain transformations made in pretend situations. For example, they examined young children's ability to understand the "consequences" of spilling pretend tea all over the table, and to act accordingly (by pretending to wipe it up). The authors argued, in agreement with Perner (1991) and Lillard (1993a), that young children need not understand mental representations in order to understand pretense (see also Harris, 1988). However, while their studies revealed an impressive level of hypothetical reasoning in even very young children (18-24 months), the focus of those studies was not on young children's understanding of the mental representations in pretense. As Wellman and Hickling (1993) pointed out in their commentary of the studies, "*when* children understand *what* about the pretender's special relations to the pretense seem a central question for the investigation of children's understanding of pretense. Moreover, for Harris and Kavanaugh this constitutes a crucial theoretical hypothesis that needs to be tested" (p.99). Harris and Kavanaugh's studies did not examine this important development. The purpose of the present studies was to investigate this issue, in an effort to provide important information regarding the development of children's metarepresentational abilities.

The Present Proposal

The present proposal takes Wellman's position (Wellman, 1990), in asserting that a failure to understand false beliefs does not imply a failure to understand any mental representations. Furthermore, this line of reasoning is

extended here to a discussion of children's understanding of pretense. Specifically, it is argued that children's ease of understanding pretense situations does not imply that this is a nonrepresentational type of understanding (an implication that stems from an assumption that 3-year-olds lack metarepresentational ability). It is suggested, rather, that young children do understand the mental states of a person engaged in pretense, mental states that are contrary to reality. But because they are intentional distortions of reality, there is no threat to the child's representation of it, so no cognitive conflict occurs.

To sum up, the following points are put forth to explain young children's relatively early understanding pretense, as compared with false belief: First, 3-year-olds do have a representational understanding of pretense, at least in the limited sense of a) understanding that it involves mental representations, which are b) not taken by the pretender to correspond to reality. Experiments 1 and 2 assessed children's understanding of these two aspects, respectively. This suggestion counters that of Lillard (1993a; 1993b), who proposes that young children understand pretense only in terms of overt actions. It is acknowledged, however, that they may have a very limited understanding of other, more complex aspects of the representational nature of pretense (for example, the type of content-relevant knowledge required to pretend), as suggested by Lillard.

Secondly, it is proposed that this understanding does, in fact, involve the same metarepresentational skill as understanding false belief. That is, both conceptualizations involve understanding a mental representation of reality as being a certain way. Pretending a play stick horse is a real horse involves representing the actual stick horse as being real. It is suggested here that 3-year-old children understand this representational relationship in pretense. This point counters Perner's suggestion (Perner, 1991) that pretense is not a

metarepresentational skill. It is suggested here, then, that while pretending may not require metarepresentational skill, understanding pretense does.

Finally, it is suggested that the important difference between understanding pretense and false belief is that the former is a mental state that does not purport to correspond to reality; thus, there is no contradiction between this mental state and the true state of affairs (as represented by both the pretender and the observer). False belief, on the other hand, involves seriously thinking that something is the case when it is not, an understanding which requires a more advanced representational ability. Although Perner (1991) acknowledges that the seriousness of the mental representation is important, he is interpreted as suggesting that it is important because only in serious situations is a true understanding of mental representations required (in terms of understanding contrary representations). It is argued here, instead, that this representational ability develops early and is first revealed in situations where the representation involved is not intended as a serious one. Only later can children comprehend more complex situations where serious representations of reality are contradictory.

The present experiments were the first to directly assess the nature of young children's understanding of mental representations held by someone engaged in pretense. Aside from providing important information about understanding of pretense, the results were also expected to have important implications regarding the nature of 3-year-olds' difficulty with false belief tasks.

CHAPTER 2
EXPERIMENT 1

Purpose

The purpose of this study was to investigate young children's understanding of the representational nature of pretense, utilizing a more direct assessment of their knowledge of mental states than has typically been utilized in previous research. Specifically, children were shown pictures depicting a protagonist engaged in pretense, after which they were asked to point to one of two alternate "thought pictures" that reflected the mental representation held by the protagonist at that moment. One thought picture depicted the reality, while the other depicted the current (contradictory) mental representation (and was the correct response). A recent study by Flavell, Green, and Flavell (1992) has shown that 3-year-olds are capable of understanding the concept of thought bubbles as reflecting mental states (see also Hadwin & Perner, 1991; Yuill, 1984).

Subjects' understanding of contradictory mental representations in pretense was compared with that of two other mental states: Representations of past versus present (memory), and of false belief. It was of interest to directly compare performance on the pretense and false belief scenarios. The third mental state, memory, was included in order to make a stronger prediction about the pattern of responses. As with pretense (and unlike false belief), memory involves mental representations that are not taken to accurately correspond to the present reality. Therefore, responses to all three types of scenarios should reveal whether children's difficulty lies in understanding any mental representation that contradicts a specific referent, an explanation suggested by

Lillard (1993a; 1993b; Lillard & Flavell, 1992) or, alternatively, if they only have difficulty with contradictory "serious" mental states such as beliefs.

Another variable that was manipulated was whether or not protagonists in the scenarios were currently engaged in overt action. Lillard and Flavell (1992), as discussed earlier, found that 3-year-olds were able to distinguish pretense from reality only if the pretense was accompanied by overt actions. It was of interest in the present study to determine if this manipulation influences their ability to correctly identify the mental representations in pretense. In order to ensure that the mental state scenarios were as similar as possible for individual subjects, all mental state scenarios in the action conditions (rather than just the pretense scenarios) depicted a protagonist engaged in some relevant action, while no protagonist in the nonaction scenarios were engaged in any overt action.

Additionally, one scenario for each mental state pertained to an object's location, while the other pertained to an object's identity. This manipulation was included in order to ensure that scenarios used in the present study were as similar to those used in standard false belief tasks as possible. Previous studies of children's understanding of false belief have either pertained to the location or the identity of an object. This was the first study to include a direct comparison of performance on these two mental state types; however, no specific differences in performance among the two scenario types were predicted.

Children's understanding of contradictory mental states has not previously been assessed in this manner. Use of thought pictures enabled a direct assessment of their understanding, which would preclude having to make inferences about children's representational knowledge from their predictions about protagonists' behaviors, as is done in typical false belief tasks.

Several outcomes were possible. If, as Lillard (1993a; 1993b) suggests, 3-year-olds have a nonrepresentational understanding of pretense, then they should not correctly identify the mental state that contradicts reality as belonging to the pretender (in either the action or nonaction pretense conditions). In fact, according to Lillard's view that they have difficulty conceptualizing any mental state that contradicts a specific real-world referent, they should not offer correct responses to any of the scenarios.

Specific predictions about patterns of performance can also be derived from Perner's theory (Perner, 1991). If young children, as "situation-theorists," equate thought with the thought about situation, then they should choose the correct mental state pictures for all three scenario types, but for the wrong reasons. Stated differently, children should choose the mental state picture that depicts the "thought about" situation. For example, given information that a protagonist thinks that a fish is on his hook (when there is actually a boot on the end of the line), and asked to choose the picture that is in his head (a fish or a boot), 3-year-old children should interpret this information to mean something like, "He's thinking *of* a fish on his hook" (rather than, "He's thinking that there is a fish on his hook") and choose that picture. Notice that this choice would not have to be based on an understanding of a sense (mental state) that differs from its referent (reality). Instead, children could (and would, in Perner's view) ignore the representational relationship altogether.

On the other hand, Perner might argue that since the reality is evident in these scenarios, subject should associate the protagonist with that situation. This has been his explanation for 3-year-olds' poor performance on standard false belief tasks. However, in this case, children should choose the thought picture that corresponds to reality for every scenario. In any case, Perner's theory would not account for performance differences found among scenarios.

Alternatively, if, as is proposed here, 3-year-olds have difficulty only with "serious" mental states that are meant to accurately reflect reality, then they should do poorly only on the false belief scenarios. They should perform well on the pretense scenarios, as these simply involve understanding of a reality representation and an alternate pretense representation. Similarly, they should also be correct on the memory scenarios, because this understanding of nonserious alternate mental representations is directly analogous to that of pretense representations by the present account. Thus, correct responses to both mental state scenarios involve understanding of a representation that does not actually correspond to reality (thus revealing a true representational understanding), but neither mental state actually contradicts reality, because no correspondence is assumed.

It might be the case that 3-year-olds only respond correctly in the pretense scenarios if the protagonist is actively engaged in pretend play. This finding would be consistent with the suggested explanation for Lillard and Flavell's (1992) results: Perhaps young children do indeed have an understanding that pretense involves representation as well as action, but unless the pretense is accompanied by an action they have difficulty regarding it as pretend play.

A sample of 4-year-olds was also included in Experiment 1, for comparison purposes. These children, for the most part, were expected to answer questions in all scenarios correctly, as they are typically found to have a relatively mature understanding of contradictory mental states such as false belief. Additionally, performance of this group served as a control for possible alternative explanations of 3-year-olds' performance in terms of response biases or other factors that might interfere with an assessment of their true understanding.

Method

Subjects

Subjects were 30 3-year-olds and 29 4-year-olds, drawn from day care centers serving a predominantly white middle class population in North Central Florida. Three children (all young 3-year-olds) were unable to pay attention, and eight children failed the pretest (described below). These children were dropped from the study. Thus, a final sample of 24 3-year-olds (11 males and 13 females, age 36-48 mos., $\underline{M}$ = 42 mos.) and 24 4-year-olds (nine males and 15 females, age 49-60 mos., $\underline{M}$ = 55 mos.) participated in the study. Twelve children at each age were divided randomly into the action and nonaction conditions, with approximately equal numbers of boys and girls at each age in each condition. All subjects were tested individually by a female experimenter in a quiet room at the school.

Design

A 3 (mental state type: memory, pretense, or false belief) x 2 (property: identity or location) x 2 (action or nonaction) x 2 (age: 3- or 4-year-olds) mixed factorial design was utilized, with age and action vs. nonaction as between subjects variables, and mental state type and property as within subjects variables.

Each scenario was used equally often as a pretense, memory, or false belief scenario, in order to control for any effects of a particular scenario on performance. Thus, three different lists of scenarios were generated which differed in the particular scenarios that were used for pretense, memory, and false belief mental states. Four children at each age in each of the action and nonaction conditions were assigned randomly to each list, with approximately equal numbers of males and females in each group.

Procedure

Warmup. Subjects were first given a warmup task, intended to acquaint them with the notion of thought pictures as revealing mental representations held by the protagonist shown. The experimenter began, "Sometimes when we think of things, we make pictures in our heads." Then she provided an example of something she was currently thinking of, describing the "picture" in her head. Following this, subjects were asked to make a picture in their heads of a puppy and describe it to the experimenter.

Subjects were then shown a drawing (approximately 4" x 4") of a child who was sitting and thinking about something. Another, smaller picture (approximately 3" x 3") was presented, with an arrow leading from the protagonist's head to the smaller picture. This picture depicted the protagonist petting a kitten. Subjects were told, "This is Sarah. Sarah is thinking about something right now. The picture here shows us what Sarah is thinking about. See? The arrow goes from her head right up to the picture." Subjects were then asked to describe what Sarah was thinking about. Their response was repeated, along with an explanation of the thought picture (i.e, "That's right, she's thinking of petting a kitten. See? That's what's in the picture.") Next, subjects were asked if the protagonist is thinking of a big red ball. Again, their responses were repeated (or corrected), and the thought picture was explained again (i.e., "That's right (actually), she's not thinking of a big red ball, because there is not a ball in this picture that shows what's in her head.").

Pretest. The purpose of the pretest was to ensure that subjects understood the concept of thought pictures and were able to follow instructions, and also to get them accustomed to choosing the thought picture that depicted what a protagonist was thinking. This scenario was similar to those used in the actual tasks, except that there was no direct contradiction between the mental state and

reality. Subjects were shown a drawing of a child who was thinking about something. They were told, "This is Nathan. He is thinking about something. Sometimes Nathan thinks about eating an ice cream cone, and sometimes he thinks about eating a banana. Right now Nathan is thinking about eating an ice cream cone (or banana, for half the subjects)." At this point, two thought pictures were presented, one depicting the protagonist eating an ice cream cone and one depicting him eating a banana. The experimenter continued, "Right now, while Nathan is thinking, which of these two pictures do you think is in his head?" Children who failed this task were dropped from the study.

Mental state task. Following the warmup and the pretest, children were presented with the six mental state scenarios, in random order. These scenarios were similar to the pretest, except that the mental representations held by the protagonist contradicted a specific referent. Wording of instructions for all mental state scenarios was made as consistent as possible. Instructions for each mental state scenario are provided in Appendix A. In one scenario, for example, children were shown a picture of a child who was pretending (or remembering, or falsely believed, depending on the condition) that a fish was hooked onto the end of his fishing line, when there was actually a boot on the line. For the action version of this scenario (presented to half the subjects), the story protagonist was holding the fishing rod, actively "reeling it in," while in the nonaction version the protagonist was just sitting on the bank, with the fishing rod resting up against a bucket.

Following presentation of this picture, subjects were presented with two alternate "thought pictures" that were placed over the head of the story protagonist, with arrows leading from his head up to each picture. Figure 1 shows the Fish scenario, including the original picture and the "thought pictures" that accompanied it. The dimensions of the first drawing were approximately 7"

x 7", while dimensions of the "thought pictures" were approximately 3" x 3" each. Subjects were asked to point to the picture that was in the protagonist's head "right now while he's pretending (or remembering, or thinking)." One thought picture depicted the real situation (in this case, a boot on the end of the fishing line), while the other thought picture depicted the mental representation held by the protagonist (in this case, a fish on the end of the line). Thus, the latter picture was the correct response. Placement of the pictures (either on the left or the right side above the story protagonist's head) was randomized. It should be noted that the reality thought picture was presumably very salient to the subjects, as the large picture that depicted the real situation remained in front of the children throughout the task. Thus, a correct response required the subject to override any tendency to choose the picture that "matched" the large picture.

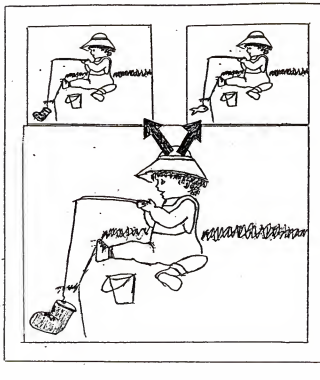

Figure 1: Sample scenario drawings for Study 1.

Results

Scoring

Children were given a score of 1 for correctly choosing the thought picture that depicted the mental state held by the story protagonist for each scenario, and a score of 0 for an incorrect response. There were two scenarios for each mental state, so the possible range of scores for each mental state was 0-2.

Preliminary Analyses

Performance on the two scenarios of each mental state type were combined, for a possible score of 0, 1, or 2 correct choices for each mental state type. A preliminary ANOVA which included the factors of sex, list, and age revealed no main effects or interactions of sex or list with any others; thus, these variables were not considered further. In addition, no main effect of age was found for performance on the mental state scenarios. If, as predicted, 3-year-old children performed significantly worse on the false belief scenarios than on the pretense or memory scenarios, while performance of the 4-year-olds did not differ as a function of scenario type, then an age x mental state interaction should be found. In fact, this interaction was of borderline significance, $F(2, 72) = 3.07$, $p = .053$. However, although no effects involving age were significant, it was of theoretical interest to examine performance of 3-year-olds and 4-year-olds separately. Therefore, all subsequent analyses were run separately for each age.

Main Analyses

Table 1 shows the number of children at each age who scored a 0, 1, or 2 for each of the three mental state scenarios.

Table 1

Number of 3- and 4-year-olds Scoring 0, 1, or 2 on Each Mental State Scenario

	3-year-olds (N=24)		
Mental state	Number correct		
	0	1	2
Pretense	0	9	15 (1.6)
Memory	2	7	15 (1.54)
False belief	4	13	7 (1.12)

	4-year-olds (N=24)		
Mental state	Number correct		
	0	1	2
Pretense	4	4	16 (1.5)
Memory	6	7	13 (1.4)
False belief	7	6	13 (1.3)

Note: Mean scores are provided in parentheses.

Three-year-olds. In order to examine possible effects of property and condition, a 2 (condition: action or nonaction) x 2 (property: identity or location) x 3 (mental state: pretense, memory, or false belief) saturated repeated measures ANOVA was run, with condition as a between-subjects variable, and property and mental state as within-subjects variables. The dependent variable of interest was the number of scenarios answered correctly. Because there was

only one scenario presented for each combination of mental state and property, the possible range of scores for this analysis was 0-1.

This analysis revealed no significant main effect of property. However, a trend for the effect of property was found, $F(1, 22) = 2.95$, $p < .10$. This finding was due to the fact that performance on identity scenarios, ($M = 2.4$) was somewhat better than performance on location scenarios, ($M = 1.9$) for children this age.

Although the interaction of property and mental state was nonsignificant, it was of theoretical interest to examine the possible effect of property separately for each mental state. In particular, previous studies have assessed children's understanding of false belief without distinguishing between false belief for location and false belief for identity. It was of interest to determine if these types of scenarios are equally difficult for 3-year-old children. Therefore, planned comparisons were conducted, examining performance on each mental state separately for each scenario type (identity vs. location). A significant effect was found for the false belief mental state only, with subjects performing significantly better on the identity scenarios ($M = .70$) than on the location scenarios ($M = .40$, $t(23) = 2.07$, $p < .05$). This finding will be discussed later.

It was of primary interest in this study to determine whether 3-year-olds' performance varied as a function of mental state scenario type. Thus, in order to provide a somewhat greater range of responses, the dependent variable was collapsed across property for this analysis. A 2 (condition: action or nonaction) x 3 (mental state: pretense, memory, or false belief) ANOVA was conducted, with repeated measures on the mental state variable. The dependent variable of interest was the score (range = 0-2) for each mental state scenario type. This analysis revealed a significant main effect of mental state, $\underline{F}(2, 44) = 7.75$, $\underline{p} = .001$. Paired-difference t-tests showed, as predicted, that performance on the

pretense scenarios (M = 1.63) was significantly better than performance on the false belief scenarios, (M = 1.12, $t(23) = 4.15$, $p = .0004$), as was performance on the memory scenarios, (M = 1.54, $t(23) = 2.63$, $p = .01$). Performance on the pretense and memory scenarios did not differ. Likewise, no effect was found for the condition (action vs. nonaction) variable.

In order to further examine the developmental pattern of responses, additional nonparametric analyses were run. In considering the frequency of the scores 0, 1, and 2 for each mental state, Kolmogorov-Smirnov 1-sample tests revealed that performance was significantly better than chance only for the pretense and memory scenarios (D = .33 and D = .30 for pretense and memory scenarios, respectively, both ps < .05).

One way to determine if subjects truly have an understanding of the contradictory mental representations involved in a given scenario type is by looking at whether they consistently choose the correct thought picture (i.e., score a 2) for that scenario type. By this criterion, and using Cochran's Q nonparametric test for related samples, significantly more subjects understood the contradictory mental representations involved in pretense and memory than in false belief scenarios ($Q = 28.5$, $p < .001$).

Further evidence for the existence of a developmental progression in understanding of mental representations (first "nonserious," then "serious") was provided by Sign tests, examining individual patterns of performance. Specifically, among 3-year-old children, all subjects scored at least as high on pretense scenarios as on false belief scenarios, $X(11) = 0$, $p < .001$. A similar trend was found for performance on memory scenarios versus false belief scenarios: Children were significantly more likely to score higher on memory than false belief, than the reverse pattern, $X(15) = 3$, $p < .05$.

4-year-olds. A 2 (condition: action or nonaction) x 2 (property: identity or location) x 3 (mental state: pretense, memory, or false belief) repeated measures ANOVA was conducted, as with the 3-year-old subjects' data, with condition as a between-subjects variable, and property and mental state as within-subjects variables. The dependent variable of interest was the number of scenarios answered correctly. This analysis revealed no significant effects of property, either alone or in conjunction with any other variables. Thus, for this age group, scenarios that pertained to location were not any more difficult than scenarios that pertained to identity.

In order to examine effects of mental state type, a 2 (condition: action or nonaction) x 3 (mental state: pretense, memory, or false belief) ANOVA was conducted, with repeated measures on the mental state variable. The dependent variable of interest was the score (range = 0-2) for each mental state scenario type. This analysis revealed no significant effects of mental state, either alone or in interaction with the action variable (*M*s = 1.5, 1.4, and 1.3, for pretense, memory, and false belief, respectively). Similarly, no effects were found for the condition (action vs. nonaction) variable. Thus, as predicted, 4-year-olds' responses did not differ as a function of mental state scenario type.

Nonparametric analyses (Kolmogorov-Smirnov 1-sample tests) conducted on frequency scores for this group revealed that, as with the 3-year-old group, performance was significantly better than chance only for the pretense scenarios (D = .33 p < .05). However, it should be noted that three 4-year-old subjects responded incorrectly to every scenario. These were the only children in the entire sample who responded this way. If these outliers are removed from the sample, performance levels for the remaining 21 4-year-olds significantly exceed chance levels for all three scenario types (Ds for memory and false belief scenarios = .33, ps < .05). Thus, overall, 4-year-old subjects performed

relatively well on all scenario types, with no differences in performance found as a function of scenario type, as predicted.

Discussion

Study 1 was the first to utilize thought pictures to examine young children's understanding of contradictory mental representations. In addition, it was the first to include a within-subjects comparison of pretense and false belief understanding, utilizing scenarios that were virtually identical in all other respects. As predicted, 3-year-old subjects were more likely to choose the correct thought picture as depicting the mental representation held by a story protagonist for pretense and memory scenarios than for false belief scenarios. In fact, performance was better than chance only for these two scenario types. However, it is unlikely that children were simply responding randomly on the false belief scenarios, as Sign tests revealed that subjects who responded correctly on the false belief scenarios also tended to do well on the other two scenario types. The fact that the reverse pattern was not found suggests that there was a developmental progression in comprehension of contradictory mental representations, first for the mental representations that were not taken to correspond to reality, and only later for the "serious" mental state of belief. Four-year-olds' performance, as predicted, did not differ as a function of scenario type, which suggests that by this age children understood contradictory mental representations in false belief as well as in other, "nonserious" mental states.

The findings of Study 1, then, do not support Lillard's (1993a; 1993b) suggestion that 3-year-olds (and 4-year-olds) conceptualize pretense only in terms of overt actions. Based on her argument that young children cannot conceive of *any* mental representation as possibly contradicting a specific referent, subjects should have chosen the reality thought picture in every case.

As discussed earlier, Lillard and Flavell (1992) found that 3-year-old children were more often able to report that a protagonist was pretending something that differed from reality when that protagonist was engaged in an overt action. They concluded that perhaps young children do not understand the mental representations in pretense, but instead equate pretending with the overt actions involved. It was hypothesized here, on the other hand, that young children do understand pretense as involving mental representations, but perhaps only when a protagonist is engaged in some overt action, which more clearly identifies the situation as involving pretense. However, this hypothesis was not confirmed in the present study. Subjects chose the correct thought picture as often in the nonaction conditions as in the action conditions.

It is possible that in the present study it was clear to the subjects that the protagonists were pretending, even when they were not performing an overt action. For example, in the nonaction version of the Fish scenario, the story protagonist was sitting on the bank, watching the water as his fishing rod was leaning up against a pole. Thus, perhaps the crucial factor to influence performance is not whether a story protagonist is performing some overt action, but is instead whether the general context of the story makes it feasible that the protagonist is pretending. This manipulation is worthy of further research.

As discussed earlier, Perner (1991) suggests that young children are "situation theorists" who simply conceptualize mental representations (e.g., thought) in terms of their referents (e.g., "situation thought about"). Thus, Perner's explanation for children's apparent understanding of pretense is that, when faced with the knowledge that someone is pretending there is a fish on his hook, for example, they would simply create the mental model ("fish on hook") and view the protagonist as acting in accordance with this alternate situation. Thus, in terms of the present study, Perner would most likely argue that correct

performance could be attained without a true understanding of representational relationships; that is, a child could simply choose the thought picture that depicted the "thought-about" situation.

However, if young children are actually relying on this type of strategy in choosing the correct thought picture, then they should not have any difficulty on the false belief scenarios, because they would simply interpret, "He thinks there is a fish on his hook" as "He's thinking of a fish." Thus, they should choose the correct thought picture on false belief scenarios as well. This pattern of responses, however, was not found. The fact that 3-year-old children performed significantly worse on the false belief scenarios than on the other two scenario types suggests that there was something about their interpretation of the false belief scenarios that discouraged them from choosing the mental state thought picture. It is suggested here that in this case a representation that was taken to correspond to reality contradicted it-- and 3-year-olds cannot understand this type of situation.

Thus, it appears that Wellman's (1990) theory of metarepresentational development best accounts for the present results. As discussed earlier, he argues that young children do in fact understand some aspects of mental representations, but because of their "copy theory" of reality-oriented mental representations they have particular difficulty understanding that these types of representations can sometimes misrepresent their referents.

The present results also have implications for alternative explanations of children's failures on other types of false belief tasks. Specifically, this task involved a relatively simple judgment of a protagonist's mental representation, without requiring the subject to make any further predictions of behaviors that are based on these mental representations (as is the case in standard false belief tasks). The fact that 3-year-olds still had great difficulty even with this simpler

assessment indicates that it is indeed something about false beliefs (rather than some extraneous task variable) that account for low performance on other measures of this understanding. On the other hand, performance on this measure was somewhat better than typical performance on the standard false belief task (around 25% correct for 3-year-olds). It is suggested here that this type of paradigm might allow the experimenter to more directly assess children's understanding of mental representations per se, without the potential confound of requiring further judgments about actions based on these mental representations.

Another result that has interesting implications for other studies of false belief understanding was the finding that performance on false belief- identity scenarios was significantly better than performance on false belief- location scenarios for younger subjects. This finding is especially interesting in light of the fact that, while the mental state in typical false belief tasks either pertains to an object's identity or location, no other study has directly investigated whether this difference in the object of the mental representation affects young children's comprehension. The present results suggest that, perhaps in the case of false belief about an object's identity, the distinction between the mental state and its referent is more salient. However, in the present study subjects only received one scenario of each type, so conclusions must be made with caution. It is evident that studies that more systematically investigate young children's understanding of false beliefs pertaining to various situations are in order.

In sum, the results of Study 1 indicated that 3-year-olds have more difficulty conceiving of serious mental representations, such as beliefs, that contradict reality, than those that do not. The proposed explanation for this result is that the nonserious nature of various mental representations such as pretense makes them easier to understand. In order to support this proposal

however, it is necessary to determine whether 3-year-olds explicitly understand that pretense is a nonserious mental representation; that is, that a pretender does not seriously believe what she is pretending. This was the focus of Experiment 2.

CHAPTER 3
EXPERIMENT 2

Purpose

The purpose of this experiment was to investigate 3-year-olds' understanding of another aspect of representation in pretense, in particular, that pretense involves an awareness that what one is pretending is not true. If, as Lillard (1993a; 1993b) and Perner (1991) suggest, young children only understand pretending in terms of overt actions, with no awareness of the mental representations involved, then they should attribute similar beliefs to protagonists who are performing the same action, whether engaged in pretense or not. Thus, in this experiment, children's understanding of the distinction between "acting-as-if" (i.e., acting on a belief) and "knowingly acting-as-if" (i.e., acting on a pretense representation, while holding an alternate belief) in terms of the actor's belief, was assessed.

Children were presented with a drawing depicting a protagonist who was pretending something (or simply performing some action), and were asked a question about the protagonist's true belief that pertained to the situation. For example, in one scenario, subjects were shown a drawing of a protagonist who was either pretending to water, or was watering, some flowers. Subjects were asked whether this protagonist believed, really and truly, that the flowers would get wet. If young children do not realize that pretense representations are not taken seriously, then they should make an incorrect judgment about the protagonist's true belief about the situation significantly more often for pretense than for nonpretense scenarios. In fact, based on Perner's conceptualization of

3-year-olds as situation theorists, these children would presumably simply associate the protagonist with the (pretense) situation in judging the belief. Thus, they should consistently respond that the belief is congruent with the situation. Alternatively, if children at this age do accurately conceptualize pretense in this manner, they should respond correctly as often for pretense scenarios as for nonpretense scenarios. Stated differently, these children should be significantly more likely to respond that a protagonist's belief is congruent with his or her action for nonpretense scenarios than for pretense scenarios.

In order to rule out the possibility that the children might respond correctly because of *their own* knowledge of the reality (for example, "He doesn't believe the empty cup is full because it's not full") rather than because of their understanding of the pretender's mental state, in these scenarios the reality was unknown to the subjects (for example, in the flowers scenario the pitcher was opaque, so it was not known whether it actually contained water).

Pretending can take different forms. It was of interest in the present experiment to determine if one type of pretending, "action pretense" (i.e., pretending to do something) might be easier for children to understand than "situational pretense" (i.e., pretending that something is the case). Specifically, it was hypothesized that the action pretense scenarios might involve more salient contradictions with reality, which might lead to more correct responses about the protagonist's true belief, especially for the younger children. Thus, half of the scenarios pertained to an action, while the other half pertained to a situation.

This hypothesis might appear to contradict findings from Study 1 (in which no significant differences in performance were found as a function of action versus nonaction scenarios). However, in Study 1 the action/nonaction variable pertained to what the protagonist was *doing* while engaged in pretense. In contrast, in the present study, the story protagonist is performing some overt

action relevant to the pretense in every case. However, the action/situation manipulation pertained to the *object* of the pretense.

As in Experiment 1, a sample of 4-year-olds was also included, for comparison purposes. It was predicted that by this age children should perform well on both types of scenarios.

Method

Subjects

Subjects were 28 3-year-olds and 17 4-year-olds, drawn from local preschools. Twelve of these children (nine 3-year-olds and three 4-year-olds) responded yes to every question, including a control question designed to reveal this response bias (described below), and one 3-year-old was unable to follow the task. These children were dropped from the study, leaving a final sample of 18 3-year-olds (eight males and 10 females, age 38-47 months, $\underline{M}$ = 42 mos.) and 14 4-year-olds (eight males and six females, age 49-58 months, $\underline{M}$ = 54 mos.). Two of the children who participated in Study 2 also had participated in Study 1 (7 months earlier). The subjects were tested by a different female experimenter, who did not have access to individuals' performance data for Experiment 1.

Design

A 2 (age) x 2 (scenario type: pretense vs. nonpretense) x 2 (action vs. situation) mixed factorial design, which included two within-subjects factors, was utilized. The first was depiction of the protagonist's action in terms of either action only (nonpretense), or pretense. Each subject received four scenarios of each type, in counterbalanced order. Scenario type (pretense vs. nonpretense) was blocked, to avoid confusion on the part of the subjects as to whether a particular story protagonist was pretending or not. To control for possible effects of order of presentation, half the subjects at each age received pretense scenarios first and half received nonpretense scenarios first. As in Study 1, each

of the eight scenarios was used for both pretense and nonpretense scenarios, balanced across subjects, to control for possible effects of a particular scenario.

The second within-subjects variable was whether or not a scenario pertained to an action or a situation. This variable was crossed with scenario type, so that two of the four pretense scenarios depicted a protagonist pretending to perform some action, while the other two depicted a protagonist who was pretending that a particular situation was true. The same was true for the nonpretense scenarios. (As discussed earlier, though, protagonists in all scenarios were depicted as performing some action that pertained to the pretense representation.) Presentation of action and situation scenarios was also blocked, so that subjects were presented with both action-pretense scenarios together, situation-pretense scenarios together, and so on.

In all, eight scenario list orders were constructed, four of which presented pretense scenarios first. The four scenario lists within each order (pretense vs. nonpretense first) varied as to the particular scenarios that were utilized, as well as in the order of presentation of the crossed variable (action vs. situation). Subjects were divided randomly into each list order, with an effort to ensure that, to the extent possible given the limited number of subjects, approximately equal proportions of males and females were in each list order, and also that the mean age of children in each list order did not significantly differ.

Two control scenarios were also included. Control 1 was included primarily to provide further information about subjects' reasoning in case of possible ceiling effects. Specifically, the purpose of this control scenario was to examine whether subjects' responses to the pretense scenarios could be due to their making an inference such as, "If she's pretending to water the flowers, then she must not be really watering the flowers, so they will not be getting wet." From an inference like this children might correctly respond that the protagonist

does not believe the flowers will get wet, but without ever considering the mental state held by the pretender (e.g., simply regarding pretense as "silly" behavior). Therefore, in the first control scenario, subjects were required to make an inference about a pretender's true belief about a situation, when it differed from their own stated belief about that situation. In addition, subjects were asked to justify their responses, in an effort to reveal how they were thinking about the situation. Correct responses to this control scenario, then, would have to be based on a consideration of the story protagonist's mental representation of the situation.

The second control scenario was included to reveal any possible tendency for these young children to respond "yes" to every question. In this scenario, a protagonist was pretending something that was obviously not true. The reality in this scenario, unlike in the other pretense scenarios, was evident. Therefore, a child could presumably correctly respond that the story protagonist does not believe what she is pretending, without considering the mental representation of the protagonist. As the correct response was "no," any child who responded "yes" to this and the other nine scenarios was dropped from the study.

Procedure

All subjects were tested individually in a quiet room of the preschool, by a female experimenter. Complete instructions for all scenarios are listed in Appendix B. After a brief introduction describing the task, subjects were shown drawings of a protagonist engaged in some activity. For example, in one scenario, a child was shown holding a water pitcher over a plant. As described earlier, the pitcher was opaque, so that it was unknown whether or not it actually contained water. Children who received this as a pretense scenario were told, "See this girl? She's holding a pitcher over some flowers. She's pretending that she's watering them."

Following this description, subjects were asked to repeat what the story protagonist was doing, (or pretending), in order to ensure that they were paying attention. Finally, they were then asked, "For real, does she think that the flowers will get wet, really?" Instructions for the nonpretense scenarios were the same, with the exception of the action (or situation) statement. For example, in this scenario subjects were told that the protagonist was simply "watering the flowers." The belief question was the same regardless of whether the scenario was a pretense or nonpretense scenario. Thus, a correct response for pretense scenarios was "no," while a correct response for nonpretense scenarios was "yes." It was decided that if subjects were asked about the true belief directly pertinent to the action (e.g., "Does she think that she's watering the flowers, really and truly?"), there would be a risk of the tendency to simply view this question as a repetition of the original statement and respond "yes." Therefore, in all scenarios the belief question pertained instead to some future event related to the situation.

As described above, subjects were presented with the eight scenarios, in a blocked order. Scenarios were identified as pretense or nonpretense scenarios before each block. For example, children who received pretense first were told, "In the first few pictures I show you, the kids are all pretending something." Before nonpretense scenarios were presented, subjects were told, "In the next few pictures I show you, the kids aren't pretending anything at all, they are just doing something." These instructions were included to help subjects keep track of whether or not protagonists in particular scenarios were pretending.

Following presentation of the eight task scenarios, the two control scenarios were presented (with Control 1 scenario preceding Control 2 scenario). These scenarios were always presented last, in order to avoid the

possibility that responses to these scenarios might affect performance on the others.

Results

Scoring

Subjects' scores on each of the pretense and each of the nonpretense scenarios were combined for a total of four possible correct responses on each scenario type. Except where noted, these scores constituted the dependent variables of interest. In addition, control scenarios were scored as correct (1), or incorrect (0)

Preliminary Analyses

ANOVAs, conducted separately for each age group, with list order (1-8) as the independent variable and age as the dependent variable, revealed that mean ages among different list orders did not significantly differ. In order to determine whether performance differed as a function of order of presentation or whether a particular scenario was used as pretense vs. nonpretense (that is, within each group of subjects receiving pretense scenarios first and nonpretense scenarios first), ANOVAs were run, with condition (1-4 or 5-8) as the independent variable, and scores for the pretense and nonpretense scenario groups as the dependent variables. These analyses revealed no effect for any particular condition, so this variable will not be considered further. A 2 (sex) x 2 (age) x 2 (order: pretense first vs. nonpretense first) repeated measures ANOVA revealed no significant effect of sex, either alone or in conjunction with any other variables. Thus, scores were collapsed along this variable for subsequent analyses.

Main Analyses

The main focus of this experiment was to determine if subjects' performance on pretense scenarios differs from that of nonpretense scenarios.

Because order of presentation (pretense first vs. nonpretense first) was expected to possibly affect performance, this variable was also included in the main analyses. A 2 (age) x 2 (order of presentation) repeated measures ANOVA was conducted, with performance on pretense scenarios and nonpretense scenarios as the dependent variables. This analysis revealed a significant Order x Scenario type (pretense vs nonpretense) interaction, $F(1, 28) = 8.44$, $p = .007$. Follow-up t-tests revealed that order of presentation did significantly affect performance, with performance on pretense scenarios being significantly better for children who received pretense scenarios first, $t(32) = 3.17$, $p = .003$, and a trend for performance on nonpretense scenarios being better for children who received those scenarios first, $t(32) = 1.67$, $p = .10$. Thus, children at both ages were likely to respond similarly to the second scenario group as they did to the first group, leading to a lower performance score. Table 2 shows the mean scores on both scenario types, organized by order of presentation.

A significant main effect for age was also revealed, $F(1, 28) = 5.33$, $p < .05$. Thus, overall performance (range = 0-8) by 4-year-olds ($M = 5.36$) was significantly better than that of 3-year-olds ($M = 4.0$). In addition, for theoretical reasons it was of interest to examine performance of the two age groups separately. Therefore, ages were run separately in subsequent analyses.

In order to control for the order of presentation effect, the cleanest measure of performance on pretense vs. nonpretense scenarios would involve between-subjects comparisons, comparing performance on pretense scenarios of those children who received those items first, with performance on nonpretense scenarios of children who received those first. These analyses, performed separately for each age, revealed, as predicted, no significant differences in performance as a function of whether or not the story protagonist was engaged in pretense ($t(16) = .8$ and $t(12) = .3$, for 3-year-olds and 4-year-olds

respectively, both ps > .05). That is, subjects at both ages were able to correctly identify the true belief held by the story protagonist equally often for pretense or nonpretense scenarios.

Table 2

Mean Scores on Pretense and Nonpretense Scenarios for 3- and 4-year-olds, by Order of Presentation

	Scenario type	
Order of presentation	Pretense	Nonpretense
(3-year-olds)		
Pretense first (N =9)	2.33 (1.4)	1.78 (1.1)
Nonpretense first (N =9)	1.11 (1.3)	2.78 (.83)
(4-year-olds)		
Pretense first (N =8)	3.38 (1.1)	2.5 (2.1)
Nonpretense first (N =6)	1.5 (1.8)	3.16 (1.3)

Note: The possible range of scores was from 0-4 for each scenario type. SDs are given in parentheses.

Another way to examine this performance is to determine whether children were more likely to respond that a protagonist's belief is congruent with her action for the nonpretense scenarios than for the pretense scenarios. If children understand pretense as involving contradictory mental representations, they should make this distinction. T-tests (one-tailed) revealed a significant

difference in the predicted direction for 3-year-olds, $\underline{M}$ = 2.78 "yes" responses to the belief question for the nonpretense scenarios, and $\underline{M}$ = 1.66 "yes" responses to the belief question for pretense scenarios, $\underline{t}(16) = 2.03$, $p < .05$. Thus, it appears that even children this age had some explicit understanding that pretense behaviors are not congruent with true beliefs. The difference in average "yes" responses to pretense vs. nonpretense scenarios was also significant for the 4-year-olds, $\underline{M}$ = 3.16 and $\underline{M}$ = .62 for nonpretense and pretense scenarios, respectively, $\underline{t}(12) = 3.98$, $\underline{p} = .001$.

Additionally, one sample $\underline{t}$-tests were conducted for each age group, to determine whether performance on each scenario type (of subjects who received that scenario type first) was significantly better than chance. This analysis revealed that, while 3-year-olds' performance was significantly better than chance on the nonpretense scenarios, ($\underline{M}$ = 2.78, $\underline{t}(8) = 2.85$, $p < .05$), it did not significantly exceed chance levels on the pretense scenario type ($\underline{M}$ = 2.33, $\underline{t}(8)$ =.70). However, it should be noted that in this case mean performance scores may mask individual patterns of performance. For example, a mean score of 2 on the pretense scenarios might indicate that children are simply responding randomly. Alternatively, it might be the case that some of the children are consistently responding correctly, while others are consistently responding incorrectly. Tables 3 and 4 show the individual patterns of performance for 3- and 4-year-olds, respectively (of subjects receiving pretense scenarios first and nonpretense scenarios first).

Table 3

Number of 3-Year-Olds Who Scored a 0, 1, 2, 3, or 4 on Pretense Scenarios (N=9) and Nonpretense Scenarios (N=9)

	Number of Correct Choices					Mean
Scenario type	0	1	2	3	4	
Pretense	1	2	1	3	2	2.33
Nonpretense	0	0	4	3	2	2.78

Note: Scores for each scenario type are for subjects who received that type first.

Table 4

Number of 4-Year-Olds Who Scored a 0, 1, 2, 3, or 4 on Pretense Scenarios (N=8) and Nonpretense Scenarios (N=6)

	Number of Correct Choices					Mean
Scenario type	0	1	2	3	4	
Pretense	0	1	0	2	5	3.4
Nonpretense	0	1	1	0	4	3.1

Note: Scores for each scenario type are for subjects who received that type first.

As is indicated in the Table 3, it appears that there is somewhat of a bimodal distribution of scores on the pretense scenarios for the 3-year-old subjects. Thus, it appears that these children either understood that a pretender's true belief differs from her pretense action, or they did not (eight of the nine subjects responded consistently on at least three of the four pretense scenarios).

Regarding 4-year-olds' performance, one sample t-tests revealed that scores were significantly better than chance, for both scenario types (M = 3.4, $t(7) = 3.70$, $p < .005$ for pretense scenarios, and M = 3.2, $t(5) = 2.15$, $p < .05$ for nonpretense scenarios).

It should be noted that based on Perner's theory of metarepresentational understanding, 3-year-olds should simply associate the protagonist with the referent situation, and consistently respond that the true belief is congruent with the action, regardless of scenario type. Thus, in this case comparison with chance performance would not be appropriate. Specifically, children should be scoring a 0 on the pretense scenarios, if they equate mental representations with the referent situation. One-sample t-tests, however, revealed that 3-year-olds' performance on the pretense scenarios was significantly better than 0 (t (8) = 4.96, $p < .05$).

Another variable of interest was whether a particular scenario pertained to an action (e.g., pretending to water the flowers) or a situation (e.g., pretending that it is cold outside). Specifically, it was considered possible that in the action scenarios, the discrepancy between the pretense and reality might be more salient. In this case, performance for the pretense-action scenarios should exceed performance on the pretense-situation scenarios. To test this possibility, planned contrasts (paired-difference t-tests) were run for pretense-action and pretense-situation scenarios. These analyses revealed no significant differences as a function of action versus situation, for either age group. However, both scenario types involved presenting subjects with information about a pretense action and asking them about the protagonist's belief (that directly pertained to the action). Thus, the distinction among scenario types was a subtle one, and apparently did not affect performance.

Finally, performance on the two control questions was examined separately. As noted earlier, the purpose of the Control 1 scenario was to control for the possibility that subjects might have responded correctly on the other pretense scenarios without considering the mental state of the story protagonist. Specifically, it could be argued that they might utilize a kind of reality-assessment strategy, in reasoning, "If she's pretending that it's bedtime, then it must not be bedtime, because when someone pretends something it's not true." Thus, they might judge that the protagonist does not believe what is being pretended, based on their own belief about the situation.

Subjects were required to make a fairly complex judgment for this scenario, in responding that a story protagonist's true belief differed from their own stated belief about a situation. Specifically, the protagonist was depicted as *pretending* what the subject had earlier stated that she *believed* to be true about the situation (in a case where the reality was not evident). Thus, a correct response would be based on an understanding that when one is pretending something, by definition, he does not believe it. Forty-five percent of the 3-year-olds and 71% of the 4-year-olds responded correctly on this scenario. While performance of the 3-year-olds is at about chance level, it should be noted that most of the subjects who responded correctly gave justifications for their responses that revealed their understanding of this aspect of pretense (e.g., "He doesn't believe there's a squirrel in the tree because he's only *pretending*"). These findings support the argument that these children were in fact considering the mental state of the pretenders in making their judgments on this, as well as on the other pretense scenarios.

The Control 2 scenario was included in order to reveal a possible response bias of answering every question in the affirmative. As discussed earlier, in this scenario subjects were shown a drawing of a story protagonist who was

pretending something that was obviously not true. Thus, a correct judgment about the protagonist's true belief would not require any consideration of the mental state, but could be inferred from the subject's own knowledge of the reality. As noted earlier, subjects who responded "yes" to this as well as all the other scenarios were dropped. However, performance of the remaining 3-year-olds was far from perfect: 65% responded correctly that the protagonist did not believe her pretense (the percentage increased to 93% among 4-year-olds). Further investigation of this response pattern for the 3-year-olds revealed that all subjects who responded incorrectly to this control scenario also scored very low (0 or 1) on the other pretense scenarios. Thus, it appears that some of the children did not yet have a solid understanding of the nonserious nature of pretense. On the other hand, it is also possible that some subjects were interpreting the belief question to mean something like, "*In her pretense*, does she believe the situation to be true?". This possibility will be discussed later.

Discussion

The findings of Study 2 indicated, as predicted, that even young children have some understanding that a pretender does not take her pretense representation to accurately correspond to reality. When asked to indicate the true belief of a story protagonist, 3-year-olds were as likely to make a correct judgment when the protagonist was engaged in pretense (and thus, held a true belief that differed from her action) as when the protagonist was not pretending (and presumably held a belief that was congruent with her action). Stated differently, subjects were significantly more likely to respond that a story protagonist held a belief that was congruent with her action when the protagonist was depicted as "just doing something" than when the protagonist was depicted as pretending something.

The results of Study 2 provide evidence that is consistent with Peskin's findings (Peskin, 1991). She found that, when provided with knowledge that a protagonist was pretending that an object was in a certain location, 3-year-old subjects were able to predict that the protagonist would look in one location while at the same time believing it was somewhere else (with 62% correct belief judgments, a finding that parallels the 58% correct belief judgments in the present study). However, in that study the reality was evident to the subjects, and in addition, subjects were told where the protagonist would pretend that the object was. Thus, correct responses to the pretense question might still have been based on a conceptualization of pretense in terms of overt actions. In contrast, in the present study, subjects were not told what the reality was, so a correct response that a protagonist's true belief differed from her (pretense) action and presumably was based upon an understanding of the (nonveridical) representational relationship in pretense.

This finding is also consistent with that of Woolley and Wellman (1993) who, as discussed earlier, found that 3-year-olds more often suggested that a protagonist believes her mental representation to accurately depict reality when a protagonist "knew" something than when she was simply "imagining" something. (In fact, if data for young and old 3-year-olds in their study are combined, the percentage of responses that a protagonist's true belief was incongruent with what the protagonist was imagining was identical to that found in the present study for pretending: 58% correct responses in both studies.) The present findings extend the previous results, to reveal that young children's understanding of this relationship is not limited to relatively clearcut reality-oriented mental representations (such as knowledge) and arguably nonrepresentational mental states (such as imagination). Thus, it appears that even young children do in fact understand certain aspects of mental

representational relationships (e.g., that some are taken to correspond to reality and others are not). However, it should be noted that in Woolley and Wellman's (1993) study, as in the present study, 3-year-olds were not yet consistently responding that a protagonist's true belief does not correspond to her alternate mental representation in the case of imagination (or pretense, as in the present study). Thus, it might be the case that while young children do have some understanding of the difference between reality-oriented versus fictional mental representations, they do not yet have a solid understanding of the presumed noncorrespondence between the latter type of mental representation and its referent (see also Harris, Brown, Marriott, Whittall, & Harmer, 1991).

It is also possible that some subjects in these studies interpreted the true belief question to refer to the mental state held within the pretense (or imagination) situation. The relatively poor performance of a subset of the subjects on the Control 2 scenario of the present study (who performed poorly on the other pretense scenarios as well) lends support to this suggestion. Other findings have also been consistent with this interpretation. For example, Hickling, Wellman, and Gottfried (1993) found that children reasoned with ease about beliefs that were held by protagonists within the context of their pretend play (see also Freeman, 1992). Perhaps this is a more natural interpretation for young children, who engage in pretense regularly.

On the other hand, examination of individual response patterns revealed a trend toward a bimodal distribution of scores. That is, children either consistently responded correctly or incorrectly (with 5 out of 9 children scoring responding correctly on at least 3 scenarios). Thus, it appears that in the present sample, the majority of three-year-old children understood that true beliefs do not correspond to pretense actions. This finding would not be expected if, as Lillard (1993a; 1993b) suggests, young children conceptualize pretense as solely

involving overt actions, with no consideration of mental representations involved.

The present results have further implications for Perner's theory as well (Perner, 1991). Specifically, if children at this age do not conceive of mental representations as such, but instead consider only the referent situation when making judgments about beliefs, then they would be expected to respond consistently that a protagonist's true belief is congruent with her action, regardless of whether she is pretending (especially in a situation where the subject does not know the reality, as in the present study). That is, they should look for an association between the protagonist and the referent situation, when making a judgment about the protagonist's belief. As the protagonist is in all cases associated with the action (whether or not he or she is engaged in pretense), young children should respond that the belief is congruent with the action in every case, according to Perner (1988; 1991). Thus, they should not get any pretense scenarios correct. The finding that performance by 3-year-olds was significantly better than 0 does not support this depiction of young children's metarepresentational understanding. Furthermore, the fact that even 3-year-old subjects were more likely to respond that a protagonist's true belief did not correspond with her action in the case of pretense suggests that they can make a distinction between the representational relationships involved in pretense and belief.

Finally, the results of Study 2 lend further support to the proposal (e.g., Wellman, 1990) that young children do understand some representational aspects of beliefs. These findings corroborate those of Moses (in press). Moses suggests that some types of beliefs are more closely tied to actions than others. For example, action beliefs are beliefs directly tied to intentions to carry out an action. If I am going to the refrigerator to get juice, I must believe that I will in

fact get juice as a result. Moses predicted that 3-year-olds might have a better understanding of these beliefs than others (e.g., situational beliefs, that are less closely related to the action--the type of beliefs commonly used in standard false belief tasks).

In support of his argument, Moses (in press) found that when young children were provided with information regarding a protagonist's intention (e.g., to put books on a table), followed by information that the intention was unfulfilled (the books fell on the floor), they were able to correctly identify the protagonist's action belief, although it contradicted reality (thus making it a false belief).

The present study also examined young children's understanding of "action beliefs," in providing children with information about a protagonist's action (i.e., "she's watering the flowers") and asking them about the relevant action belief (i.e., "does she think the flowers will get wet?"). Even in the "situation" scenarios in the present study, the test question directly pertained to the protagonist's belief about the probable results of his or her action. Three-year-old children were, for the most part, able to correctly identify the belief in these situations. As the reality was unknown to the subjects, their responses had to be based upon an understanding that actions are accompanied by certain intentional beliefs. Thus, some understanding of representations involved in belief was revealed in Study 2.

In Experiment 2, subjects were required to respond yes or no to each question. Although a control question was included in order to reveal any "yes" bias, 12 out of 45 3- and 4-year-old children were found to exhibit this response bias and had to be dropped from the study. It is true that other recent studies with young children have also had to drop a number of 3-year-olds for various reasons (e.g., Freeman, 1992, dropped 10 3-year-olds for failing a memory

control question, and Moses, in press, dropped 11 3-year-olds for failing a pretest). However, in this case there was some concern that the nature of the response requirement might have unfairly deflated the estimation of 3-year-olds' understanding of the discrepancy between reality-oriented and fictional mental states. In particular, it is possible that many children have a solid understanding of the nonserious nature of representations in pretense, but that they are unable at this age to inhibit a natural tendency to respond "yes" when faced with a yes or no question. For this reason, Experiment 2 may have underestimated children's understanding of the nonserious nature of pretense. Therefore, a third study was conducted, using a slightly different procedure that required a forced-choice response from the child instead of a yes or no response.

CHAPTER 4
EXPERIMENT 3

Purpose

The main purpose of Experiment 3 was to further assess young children's understanding that someone engaged in pretense does not actually believe what she is pretending. This study was designed in part to rectify some of the methodological problems that arose in Experiment 2. In this study children were given a forced-choice task rather than a task that required a yes or no response. Specifically, it was of interest to determine whether, if provided with situational alternatives A and B, and told that a protagonist was pretending A, subjects could infer that the protagonist must therefore believe that B is the case, really and truly.

Additionally, in the present study, subjects were required to make an inference about the protagonist's true belief to predict a future course of action. This manipulation was included because of performance patterns found in Study 2. In particular, as previously noted, it was hypothesized that part of the reason for the lower than expected performance by 3-year-olds on pretense scenarios was that they might have interpreted the belief question to pertain to the protagonist's mental state within the pretense situation. For example, when presented with information that a protagonist was pretending to water flowers and then asked whether she "thought" that the flowers would get wet, perhaps some subjects misinterpreted this to mean, "In her pretense, does she "think" that they will get wet?". This suggestion is supported by the incorrect responses to the Control 2 scenario made by subjects who also performed poorly on the other

pretense scenarios. Thus, in the present study it was decided to avoid this possibility altogether, by asking subjects about an action instead of a belief. In addition, subjects were explicitly told that the protagonist was "all done pretending" before they were asked to predict the (reality-oriented) action.

Method

Subjects

Subjects were 21 3-year-olds, drawn from local preschools. One child was unable to pay attention, leaving a final sample of 20 3-year-olds (11 males and nine females, age 36-48 months, M = 43 mos.).

Design

Subjects received four scenarios, all depicting a story protagonist engaged in a pretend activity. The order of presentation of these scenarios was randomized. In addition, subjects received one control scenario, which required a response that differed from those in the pretense scenarios. That is, in this scenario, the correct action prediction was congruent with the referent situation, rather than incongruent, as in the pretense scenarios. This scenario was always presented in the middle of the task (e.g., 3rd in order). The variable of primary interest in this study was whether performance on the four scenarios would be significantly better than chance.

Procedure

Pretense scenarios. All subjects were tested individually. Each scenario depicted a story protagonist who was pretending something. For example, in one scenario, subjects were first shown a drawing of two telephones, sitting side by side on a table. They were told, "See these phones? Well, one of these phones is a real phone, and the other one isn't. It's just a play phone." Following this, a second drawing was presented, which depicted a child sitting at the table and holding one of the phone receivers to his ear. Subjects were told, "This is Mike.

Mike knows which phone is the real one. He's decided to pretend that it is the black one. See? He is pretending that he's calling someone." Finally, a third drawing was presented, showing Mike sitting at the table looking at the two phones. At this point, subjects were told, "Now Mike is all done pretending. He wants to call his friend, for real." Subjects were asked to point to the phone that they thought Mike would use. After subjects made their choice, they were asked a memory control question, requiring them to point to the phone Mike had been using to pretend. The other three scenarios were similar in form to the Telephone scenario, and are outlined in Appendix C.

Control scenario. This scenario was included in order to prevent subjects from falling into a response pattern of always choosing the opposite item from the one that was referred to in the previous drawing. In this scenario, subjects were shown a drawing of a child sitting on a rug in his bedroom. Subjects were told, "This is Derek. Derek has a toy airplane. Sometimes Derek's plane is under his bed, and sometimes it is inside his toybox. Derek knows that right now his toy plane is inside his toybox (under his bed)." In the next picture, the protagonist was standing up, and subjects were told, "Now Derek wants to find his toy airplane to play with it. Do you think Derek will look under his bed or in his toybox?" In this scenario then, a correct response would be to choose the location that was mentioned in the first picture.

Results

Scoring

Scores for all task scenarios were combined, for a possible range of 0-4 correct.

Analyses

Action prediction questions. It was hypothesized that if 3-year-olds understand that a protagonist does not truly take her pretense to correspond to

reality, then they should correctly predict the protagonist's future action (which would contradict the pretend situation). Thus, performance on the four scenarios should be significantly better than chance. While a trend was found in the predicted direction, this difference was not significant at the $p = .05$ level ($M = 2.4$), $t(19) = 1.66$, $p < .10$.

Memory control questions. Children performed relatively well on memory control questions. If scores on the memory control questions are combined for each subject, mean scores on this measure significantly exceeded chance performance, $M = 3.25$, $t(19) = 3.8$, $p < .05$. Nine of the 15 memory control questions missed were accompanied by incorrect predictions about actions (based on the true belief). In these cases, then, children were judging that the true belief of the protagonist differed from what was being pretended (as they remembered it). It could be argued then, that based on their memory of the situation, subjects were making a correct judgment about the protagonists' true belief (and future course of action). Further examination of this pattern revealed that, overall, the percentage of scenarios for which action prediction responses *differed* from the memory responses significantly exceeded chance levels (64%, Binomial test: $z = 2.34$, $p < .01$). Another way to examine these data is to consider only the trials for which subjects responded correctly to the memory control question. When a percentage correct score was assigned to each subject based only upon these trials, performance again significantly exceeded chance levels (65% correct: $t(19) = 2.14$, $p < .05$).

Control scenario. Subjects' performance on the control scenario was also examined. This scenario simply required a prediction about where a protagonist would look for his toy, based on the protagonist's (and the subject's) knowledge of where his toy actually was. Performance on this scenario, however, was far from perfect: Eleven of the 20 chose the correct location. This finding has

implications for results on the pretense scenarios, in revealing a general difficulty among these children to predict actions from any mental states. This issue will be addressed further in the Discussion.

Discussion

The purpose of Study 3 was to further assess young children's understanding that a protagonist's pretense action is incongruent with his or her true belief about the referent situation. In this study, unlike Study 2, subjects were required to make a forced choice response instead of responding yes or no. However, results of this study did not conclusively reveal a greater degree of understanding than Study 2. Overall, performance was not significantly better than chance.

One possible explanation for results of the present study is that subjects, as in standard false belief tasks, were required to make an inference about a protagonist's true belief, and then to make an additional inference to predict the protagonist's future course of action. Thus, it is possible that subjects in the present study understood that the protagonist's true belief differed from the pretense, but had difficulty conceptualizing the belief as a cause of a future action. The relatively poor performance found on the control scenario lends support to this suggestion.

Interestingly, Wellman and Bartsch (1988) found similar, although somewhat better, performance levels (67% to 77% correct for young and old 3-year-olds, respectively, as compared to 55% correct in the present study) in a task that was fairly similar to the present Control scenario. In their task, subjects were told that an object was in one of two possible locations, and then told where a story protagonist believed the object to be. Immediately following this, subjects were asked to predict where the protagonist would look for the object. While this task is similar in many respects to the Control scenario in Study 3, one

difference might have been responsible for the lower performance found here. Specifically, subjects in the present study were first presented with the information about the possible locations and the protagonist's mental state. Following this, a different picture was presented, and subjects were told, "*Now* [the protagonist] wants to find [the object]." In this case, then, subjects might have inferred that time has passed and the object might not still be where it was before. This possibility is especially feasible given that in the pretense scenarios, presentation of the second picture signalled that time had passed and the pretense was over. Nevertheless, these findings indicate a possible general difficulty among 3-year-olds in predicting actions based on mental states.

Further support for this suggestion comes from findings of Bartsch and Wellman (1989). They found that while 3-year-olds performed poorly (as usual) when asked to predict an action based on a false belief, these subjects were able to reason backwards to explain anomolous actions in terms of false beliefs. It should be noted, however, that Moses and Flavell (1992) did not find an increase in performance with a similar task, where a two-alternative forced-choice question type was used instead of open-ended questions, as in Bartsch and Wellman (1989). Futhermore, other studies (e.g., Wellman & Bartsch, 1988) have shown that young children can predict actions on the basis of beliefs, when they are not known to contradict reality. Thus far, then, conclusions regarding the source of children's difficulties in the present study remain limited.

On the other hand, it is likely that subjects in many cases understood that the protagonist's true belief differed from what she was pretending, but that they simply misremembered what the protagonist had been pretending. The fact that subjects were significantly more likely to predict an action (based upon a belief) that *differed* from the pretense (as they remembered it) supports this suggestion. As disussed earlier, if only the trials where the pretense was remembered

correctly are considered, the number of correct action predictions significantly exceeded chance levels.

Results of the present study nevertheless do not support the contention that young children understand pretense simply in terms of overt actions. For example, if children simply conceive of protagonists as "connected" to a situation (as Perner, 1991, has suggested), then they should have consistently chosen an action that was congruent with the pretense situation when predicting the protagonist's future course of action. However, only one subject showed this response pattern for all four scenarios, while 50% of the subjects showed the opposite response pattern, in consistently choosing the action that differed from the pretense situation (on at least three of four scenarios). Thus, these children did appear to have some understanding of the (nonserious) "propositional attitude" that a pretender takes with respect to the pretense situation.

CHAPTER 5
GENERAL DISCUSSION

The Present Findings

Children's early understanding of pretense has puzzled researchers in the theory of mind area. The explanation proposed here is that young children do understand mental representational states in pretense, but that they have more difficulty understanding mental representations that are taken to correspond to reality while at the same time contradicting it, as in the case of false belief. The present series of studies aimed to determine 1) whether young children appear to understand that pretense involves mental representations rather than simply overt actions, and 2) whether young children understand the representational relationship to the referent situation (e.g., that the pretense representation is not taken to accurately depict reality).

The results of Study 1 indicated that even 3-year-old children view pretense in terms of mental representations that contradict reality. Further, the fact that these children were significantly more likely to correctly choose a thought picture depicting a protagonist's mental representation for pretense and memory scenarios than for false belief scenarios suggests that they can conceive of "fictional" mental representations that contradict reality. The results also revealed that all 3-year-old subjects scored at least as high on pretense scenarios as on false belief scenarios. This pattern suggests that this type of understanding occurs developmentally earlier for pretense than for false belief.

The findings of Study 2 further indicate that 3-year-old children have some understanding of the pretender's "mental attitude." That is, they understand that

a pretender does not consider her pretense to correspond to the true situation. Subjects were significantly more likely to respond that a protagonist believed her representation to correspond to reality when the protagonist was just doing something than when she was pretending something. This result was found even though children were not aware of the reality; therefore, their judgments had to have been made solely on the basis of their understanding of these mental representations.

In Study 3, subjects were provided with two alternative situations (A and B), then told that a protagonist was pretending that A was the case. They were subsequently told that the protagonist was "all done pretending" and asked to predict the protagonist's (reality based) action (which either corresponded to situation A or B). In this study, there was a trend for 3-year-old children to correctly predict the protagonist's action (which was incongruent with the pretense situation). Although this pattern was not significant, some failures may have been due to difficulties in remembering what the protagonist had been pretending. As discussed earlier, subjects were significantly more likely to choose an action that differed from the pretense (as they remembered it).

Taken together, the present studies revealed a level of meta-representational understanding that is generally not attributed to 3-year-old children. The findings contradict Lillard's (1993a) proposal that young children conceive of pretense in terms of overt actions only. As discussed earlier, Lillard (1993b) found that 3- to 5-year-old children responded that a protagonist was pretending to be something (for example, a rabbit), even when they were told that he did not know anything about rabbits. However, it is suggested here that metarepresentational understanding is not an all-or-none acquisition. Specifically, it might be the case that young children do not understand some of the more complex components of the nature of mental representations, such as

the knowledge required to pretend something. However, it is proposed that these children nonetheless have a more basic understanding of mental representations and, further, that their conceptualization of pretense includes an understanding that mental representations are involved.

These studies also have implications for Perner's theoretical view (Perner, 1988; 1991). He regards young children as "situation theorists" who equate mental representations like belief with their referent situations, with no understanding of the representational relationship. However, findings of the present studies do not support predictions made from this perspective. For example, 3-year-olds in Study 1 should have chosen the thought picture with which the protagonist was "associated," regardless of mental state scenario type. Thus, they should have responded correctly for every scenario (but without a true understanding of mental representations). However, they performed significantly worse on the false belief scenarios, which indicates that they had more difficulty with the contradictory "reality-oriented" representation.

Similar predictions from Perner's (1991) proposal could be made about performance in Studies 2 and 3. If children simply use an association strategy when asked about a protagonist's true belief or when asked to predict a protagonist's action, then their responses should have "matched" the information initially provided about the story protagonist in every case. For example, in Study 2, when children were told that a protagonist was pretending to water flowers, their judgment about the protagonist's true belief should have matched this information (e.g., "Yes, he believes they will get wet.").

In sum, the findings of the present studies appear to best support Wellman's (1990) view that young children might understand certain aspects of mental representations in spite of the fact that they do not yet understand false beliefs. He argues that 3-year-olds can understand fictional mental

representations *as representations*, rather than simply actions. However, their understanding of reality-oriented representations is limited. That is, they cannot conceive of reality-oriented mental representations as possibly contradicting the referent situation.

Finally, the studies presented here were among the first to directly assess young children's understanding that pretense involves mental representations that are not purported to correspond to reality. Study 1, for example, was the first to utilize thought bubble pictures to assess understanding of mental representations that contradict reality. It is suggested here that this method could usefully be applied to investigations of other aspects of meta-representational development, such as the understanding that another individual's visual perspective might differ from one's own-- a skill that Flavell (e.g., 1988) has referred to as "Level 2 perspective-taking." In addition, it might be possible to use this technique for the sort of appearance-reality tasks described in the Introduction. For example, subjects could be asked to choose the thought picture that depicts how an object, such as a wax candle made to look like an apple, appears to someone else. Use of this methodology for additional studies of metarepresentational development would provide valuable corroboration of findings that have until now been based almost entirely upon a two-alternative forced-choice type of questioning. The somewhat discrepant findings of Bartsch and Wellman (1989) and Moses and Flavell (1992), who utilized two different methods to investigate young children's ability to explain actions in terms of beliefs, illustrates the importance of using various methods to examine these issues.

Other Supporting Research

Other studies have also supported the argument that young children can comprehend the representational relationships between some representations

and their referents. For example, DeLoache (e.g., DeLoache, 1990) has found that even young 3-year-olds can use a scale model of a room to find an object in the real room, which suggests that they understand the representational nature of the scale model. Interestingly, when items in the scale model are changed slightly (for example, the "model" chair is a different color than the real chair), performance declines considerably. Thus, it appears that even in the realm of physical representations, young children have difficulty conceiving of a serious representation that does not correspond to reality.

In a recent study that is more directly related to the present proposal, Hickling, Wellman, and Gottfried (1993) examined whether young children can understand that a story protagonist might hold a mental representation that contradicts the referent situation. In one case, the mental representation was a belief about a true situation (e.g., false belief). In the other, the mental representation was a belief about a pretense situation. For example, in one scenario the protagonist (a puppet called "Billy") was pretending that there was chocolate milk in a glass. At this point he left the room. While the protagonist was gone, the experimenter persuaded the subject to change the pretense, to pretend that the glass was empty. At this point, the protagonist returned, and subjects were asked, "Right now, in Billy's pretend, does he think there is chocolate milk in the glass or is it empty?"

Hickling et al. found that, whereas 78% of 3-year-old subjects correctly identified Billy's "pretend" belief (which differed from the new pretend situation), only 28% were correct on the analogous false belief task. As the authors suggest, this result supports the proposal that young children understand that pretense importantly involves mental representations, and further, that one pretense situation may give rise to divergent mental representations.

This finding has further interesting implications. In both conditions, the protagonist held a *belief* that contradicted a known, referent situation. However, in the case of pretense, the belief was within a pretense context, so presumably in this case subjects did not perceive a true contradiction between the belief and reality--because in pretense situations, reality is suspended. Thus, these results lend additional support to the position that it is the seriousness with which the mental representation purports to correspond to reality that determines whether young children will understand a mental representation that contradicts the referent situation. As the authors conclude, "That a majority of 3-year-olds answered correctly on the pretend task but not on the false belief task suggests that a pretend context, which highlights the epistemic impossibility of states of affairs, is conducive to children's understanding that people may have divergent, or even incorrect not-real thoughts" (p. 6).

Altogether, these recent findings have provided accumulating evidence that 3-year-old children do in fact understand some very important aspects of mental representations, as shown in their apparent understanding of pretense. Based on these results, the present view is in agreement with suggestions (e.g., Flavell, Flavell, & Green, 1987; Hickling, Wellman, & Gottfried, 1993; Leslie, 1987; 1998; 1991; Taylor, Gerow, & Carlson, 1993; Wellman, 1990; Woolley, 1993) that children's propensity to engage in pretend play might actually allow them to begin to understand alternate mental representations, which has important consequences for their developing metarepresentational ability.

Additional findings have recently been uncovered in support of this proposal. For example, Leslie (1991; Leslie & Frith, 1987) reports that autistic children, who have been found to lack a "theory-of-mind," are also impaired in their ability to engage in pretend play, suggesting a relationship between the two. A recent study by Taylor, Gerow and Carlson (1993) more directly investigated

this relationship. These researchers examined individual differences in young children's tendency to engage in pretend play, as well as their performance on several "theory of mind" tasks, such as the standard false belief task. They found that, even when age and verbal IQ were statistically controlled, there was a significant relationship between young children's tendency to engage in fantasy play (e.g., to have an imaginary companion and/or to impersonate imaginary characters) and their ability to solve theory-of-mind problems.

Future Directions

A central issue of debate in the area of children's developing theory of mind historically has been the age at which understanding of the representational nature of the mind is acquired (see e.g., Perner, 1991; Wellman, 1990). It is principally for this reason that the relatively early development of pretense understanding has been of interest. However, researchers are beginning to shift their focus to the more important issue of developmental underpinnings of children's metarepresentational ability. Further work on children's understanding of pretense will no doubt provide useful information pertaining to this issue as well.

Research in this area is just beginning. For example, the fact that the results of the present studies are not consistent with those of Lillard (1993b) suggests that this type of understanding is not an all-or-none acquisition, but develops gradually, beginning with less complex concepts and improving across the preschool years. Additional studies are needed in order to tease apart the various components of mental representations that are and are not understood about pretense at an early age.

Another potentially important area of research would examine in more depth the nature of differences between pretense and imagination. Like pretense, imagination involves mental representations that are not considered to

accurately correspond to reality. However, several differences are apparent as well. For example, imagination typically does not include an action component. Woolley (1993) has argued that for this reason it is a more appropriate test of the distinction between understanding of serious and nonserious mental representations, in that successful performance cannot be explained by reference to overt actions, as has typically been the case for studies of pretense understanding (e.g., Lillard & Flavell, 1992; Perner, 1991). A related suggestion is that perhaps pretense is easier for children to understand, because the action (which blatantly contradicts reality) makes more salient the distinction between the pretense representation and the referent situation.

On the other hand, as Lillard (1993a) has suggested, imagination might be easier for young children to understand than pretense because it need not involve a "layering" of the mental representation over some referent situation, as is involved in pretense. In Perner's terms, it more often involves "thinking of" something rather than representing something as being a certain way. However, it should be noted that Woolley (1993) found that young children understood the discrepancy between imagination and reality even in cases where the imagined situation (representation) directly contradicted reality (the referent situation). It is apparent that additional studies that sort out young children's understanding of various components of pretense and imagination could provide useful information relating to the nature of metarepresentational development.

Finally, the results of Taylor et al. (1993) indicate a relationship between children's natural tendency to engage in pretend play and their understanding of mental representations. As the authors suggest, further research is indicated, which determines the nature of this relationship. For example, training studies that involve pretend play sessions might reveal improvements in children's theory-of-mind performance as a result. Aside from having important

theoretical implications, studies of this sort might have practical applications as well. For example, such "pretense interventions" have been shown to be useful for improving other social-cognitive skills, such as perspective-taking, of young children who are at risk for developmental delay (e.g., Rosen, 1974). These methodologies could usefully be applied to this area of research.

The fact that children seem to understand pretense long before they have such representational understanding in other domains continues to be an intriguing area of research. As the number of investigations in this area increases, it is becoming more and more apparent that the development of this important skill involves many complex facets that remain to be uncovered.

APPENDIX A
SCENARIOS FOR EXPERIMENT 1

Information about the action scenarios is provided in brackets. The memory and false belief scenarios include only the information that differs from the pretense scenario.

Location Scenarios

Puppy scenario

Pretense: (Drawing of boy outside.) "This is Charlie. [Charlie is throwing a ball.] Charlie is pretending that his puppy is outside with him at school. He knows that it's not really with him, it's really inside his house at home. See? (Picture of puppy in a house presented beside picture #1.) But he's pretending that his puppy is with him at school. (Placement of thought pictures.) Right now, while Charlie is pretending, which of these pictures do you think is in his head?"

Memory: "This is Charlie. Charlie is remembering when his puppy was outside with him. He knows that his puppy isn't really outside anymore, it's really in the house. See? But Charlie is remembering when his puppy was outside with him. Right now, while Charlie is remembering, which of these pictures do you think is in his head?"

False belief: "This is Charlie. Charlie thinks that his puppy is outside with him. His puppy isn't really outside, it's really in the house. But Charlie thinks that his puppy is outside. Right now, while Charlie is thinking, which of these pictures do you think is in his head?"

Teddy bear scenario

Pretense: (Picture of a girl lying in a bed.) "This is Sue. Sue is staying at her grandma's house. [She is putting a little pillow next to hers.] Sue is pretending that her teddy bear is with her in bed. She knows that her teddy bear isn't really with her, it's really in her own room at home. See? (Picture of a teddy bear in a child's room placed next to picture #1.) But she's pretending that her teddy bear is in bed with her. (Presentation of thought pictures.) Right now, while Sue is pretending, which of these pictures do you think is in her head?"

Memory: (Picture of a girl lying in bed, with toybox and door in the background-- teddy bear is by the door.) "This is Sue. She is remembering when her teddy bear was in her toy box. She knows that it's not really in her toy box anymore, it's really over by the door. See? But Sue is remembering when her teddy bear was in the toybox. (Placement of thought pictures.) Right now, while Sue is remembering, which one of these pictures do you think is inside her head?"

False belief: (Picture of a girl lying in bed, with toybox and door in the background-- teddy bear is by the door.) "This is Sue. She thinks that her teddy bear is in her toy box. It's not really in her toy box, it's really over by the door. See? But Sue thinks that her teddy bear is in the toybox. (Placement of thought pictures.) Right now, while Sue is thinking, which one of these pictures do you think is inside her head?"

Cake scenario

Pretense: (Picture of a girl walking into a kitchen.) "This is Chu Nam. [Chu Nam is holding a plate.] She's pretending that the chocolate cake is on the table. She knows that it's not really on the table, it's really on top of the refrigerator. See? But Chu Nam is pretending that the cake is on the table.

(Placement of thought pictures.) Right now, while Chu Nam is pretending, which one of these pictures do you think is in her head?"

Memory: "This is Chu Nam. She's remembering when the chocolate cake was on the table. She knows that it's not really on the table anymore, it's really on top of the refrigerator. See? But Chu Nam is remembering when the cake was on the table. (Placement of thought pictures.) Right now, while Chu Nam is remembering, which one of these pictures do you think is in her head?"

False belief: "This is Chu Nam. She thinks that the chocolate cake is on the table. It's not really on the table, it's really on top of the refrigerator. See? But Chu Nam can't see it, and she thinks that the cake is on the table. (Placement of thought pictures.) Right now, while Chu Nam is thinking, which one of these pictures do you think is in her head?"

Identity Scenarios

Fish scenario

Pretense: (Picture of lots of fish in water, and also a boot at the bottom.) "See this water? Look. It has lots of fish. And look, there's also a boot!" (This picture was included in order to make the next picture more plausible.) (Picture of a boy, sitting on a bank.) "This is Fred. [Fred is holding a fishing pole.] He is pretending that there is a fish on the hook. He knows that it's not really a fish, it's really a boot. See? But Fred is pretending that there is a fish on the hook. (Placement of thought pictures.) Right now, while Fred is pretending, which one of these pictures do you think is in his head?"

Memory: "This is Fred. He is remembering when there was a fish on the hook. He knows that there's not really a fish anymore, there's really a boot. See? But Fred is remembering when there was a fish on the hook. (Placement of thought pictures.) Right now, while Fred is remembering, which one of these pictures do you think is in his head?"

False belief: "This is Fred. He thinks that there is a fish on the hook. It's not really a fish, it's really a boot. See? But Fred can't see in the water, and he thinks that there is a fish on the hook. (Placement of thought pictures.) Right now, while Fred is thinking, which one of these pictures do you think is in his head?"

Sand scenario

Pretense: (Picture of girl sitting in a sandbox, putting sand in a plastic pitcher.) "See this pitcher? This girl is putting sand in it." (This picture was included in order to make the next picture more plausible.) (Picture of a different girl by the same sandbox.) "This is Tanisha. [Tanisha is holding the pitcher.] She's pretending that there is water in the pitcher. She knows that there's not really water, there's really sand in it. But Tanisha is pretending that there is water in it." (Placement of thought pictures.) "Right now, while Tanisha is pretending, which one of these pictures do you think is in her head?"

Memory: "This is Tanisha. She's remembering when there was water in the pitcher. She knows that there's not really water anymore, there's really sand in it. But Tanisha is remembering when there was water in it." (Placement of thought pictures.) "Right now, while Tanisha is remembering, which one of these pictures do you think is in her head?"

False belief: "This is Tanisha. She thinks that there is water in the pitcher. There's not really water, there's really sand in it. But Tanisha thinks that there is water in it." (Placement of thought pictures.) "Right now, while Tanisha is thinking, which one of these pictures do you think is in her head?"

Cereal scenario

Pretense: (Picture of a boy sitting at a table, putting a spoon into a cereal box.) "See this cereal box? It's empty. That boy is putting a spoon inside of it." (This picture was included in order to make the next picture more plausible.)

(Picture of a different boy sitting at the table.) "This is Carlos. [Carlos is holding the cereal box.] He's pretending that there is cereal in the box. He knows that there is not really cereal inside, there is really a spoon inside of the box. But Carlos is pretending that there is cereal inside. (Placement of thought pictures.) "Right now, while Carlos is pretending, which of these pictures do you think is inside his head?"

Memory: "This is Carlos. He's remembering when there was cereal in the box. He knows that there is not really cereal inside anymore, there is really a spoon inside of the box. But Carlos is remebering when there was cereal inside. (Placement of thought pictures.) "Right now, while Carlos is remembering, which of these pictures do you think is inside his head?"

False belief: "This is Carlos. He thinks that there is cereal in the box. There is not really cereal inside, there is really a spoon inside of the box. But Carlos thinks that there is cereal inside. (Placement of thought pictures.) "Right now, while Carlos is thinking, which of these pictures do you think is inside his head?"

APPENDIX B
SCENARIOS FOR EXPERIMENT 2

Information about pretense scenarios is provided in brackets.

Situation Scenarios

1. (Picture of a child holding a telephone receiver.) "See this girl? She's picking up this phone and saying "hello." [She's pretending that] the phone rang. What is it that she's [pretending?] doing?

"For real, does she think that someone will talk to her in the phone, really?"

2. (Picture of a child getting a sweater.) "See this girl? She is getting a sweater before she goes outside." [She's pretending that] it's cold outside." What is it that she's [pretending?] doing?

"For real, does she think that she might get cold if she doesn't put on her sweater, really?"

3. (Picture of a child putting a bowl of milk on the floor.) "See this boy? He's putting this bowl of milk on the floor. [He's pretending that] there is a kitty in the room. What is it that he's [pretending?] doing?

"For real, does he think that the kitty will come and drink the milk, really?"

4. (Picture of a child lying down with head on a pillow.) "See this boy? He's lying down with his eyes closed. [He's pretending that] it's bedtime. What is it that he's [pretending] doing?

"For real, does he think he's going to sleep until morning, really?"

Action Scenarios

5. (Picture of a child holding a pitcher over some flowers.) "See this girl? She's holding a pitcher over those flowers." She's [pretending that she's] watering them. What is it that she's [pretending?] doing?

"For real, does she think that the flowers will get wet, really?"

6. (Picture of a child holding a spoonful of food up to a baby.) "See this boy? He's putting this bottle up to his baby sister." He's [pretending that] he's feeding the baby. What is it that he's [pretending?] doing?

"For real, does he think that his baby sister will drink from the bottle, really?"

7. (Picture of a child holding a toothbrush with toothpaste on it up to his mouth.) "See this boy? He's putting that toothbrush up to his mouth. He's [pretending that he's] brushing his teeth. What is it that he's [pretending] doing?

"For real, does she think she will get toothpaste on her teeth, really?"

8. (Picture of a child touching a dial on an oven, and holding a pan in the other hand.) "See this girl? She's touching that button on the oven. She's turning on the oven and putting a pan in to cook something. [She's pretending to cook something] What is it that she's [pretending?] doing?

"For real, does she think that the pan will get hot, really?"

Control 1: (Picture 1: a tree.) "See this tree? Well, there is either a squirrel or a bird way up high on the branches. Do you think it is a squirrel or a bird?" (Record response.)

(Picture 2: a child in front of the tree with arm extended, looking upward.) "See that boy? He's pretending that there is a _____(child's response) up in that tree. See? He's pretending that he's feeding it."

"For real, does he think, really and truly, that a _____ is in the tree?"

Control 2: (Picture of a girl "riding" a stick horse.) "See this girl? Well, she's pretending that the stick horse is a real one. See? She's pretending that she's riding it."

"Does she think, really and truly, that the horse will run across the room all by itself?"

APPENDIX C
SCENARIOS FOR EXPERIMENT 3

Grasshopper scenario

(Picture #1: A tree and also a jar in the grass.) "See this picture? Look, there's a tree, and there's a little jar on the ground, for collecting bugs. See? There's some grass and dirt inside. There is a grasshopper, that's either over on a leaf of the tree or in the jar."

(Picture #2: A girl holding the jar.) "This is Michelle. Michelle knows where the grasshopper is, for real. She says, 'I think I'll pretend that the grasshopper is in this jar.' See? She's pretending that she caught it."

(Picture #3: Girl with her mother, standing in yard. Jar is on the ground.) "Now Michelle is all done pretending. Michelle wants to show her mom where the grasshopper is, for real. Will Michelle take her mom to see the jar or will they go over to the tree? (Point to alternatives.) Where was she pretending that the grasshopper was?"

Treehouse scenario

(Picture #1: Three girls standing side by side.) "See these three girls? Well this is Samantha, and this is Karen, and this is Teri. One of these girls is Karen's sister."

(Picture #2: Karen and Samantha in a treehouse, Teri watching them from the ground.) "Karen knows who her sister is. She decided to pretend that Samantha is her sister. See? They are pretending that they are sisters who live in a treehouse."

(Picture #3: The three girls standing in front of a house.) "Now the girls are all done pretending. Karen's mom told her to call her real sister to come

inside for dinner. Which girl do you think Karen will tell to come inside with her? (Point to alternatives.) Which girl was Karen pretending was her sister?"

Telephone scenario

(Picture #1: Two telephones sitting on a table.) "See these telephones? Well, one of the telephones is real, and the other isn't-- it's just a toy phone."

(Picture #2: Boy sitting at the table, holding one of the phones.) "This is Kyle. He knows which telephone is real and which one is just a toy. Kyle is playing. He says, 'I think I'll pretend that this black phone is real.' See? He's pretending to call someone."

(Picture #3: Boy sitting at the table, looking at the phones.) "Now Kyle is all done pretending. He wants to call someone, for real. Which phone do you think that Kyle will use? (Point to alternatives.) Which phone was he pretending with?"

Teacup scenario

(Picture #1: Two teacups sitting on a table.) "See these cups? Well, one of the cups has hot tea in it, and the other one doesn't have anything in it-- it's empty."

(Picture #2: Girl sitting at the table, holding one of the cups.) "This is Kelly. She knows which cup has hot tea and which one doesn't. Kelly says, 'I think I'll pretend that the blue cup has hot tea in it.' See? She's pretending to blow on it and take a drink."

(Picture #3: Girl sitting at the table, looking at the cups.) "Now Kelly is all done pretending. Her mother asks her to bring the cup with real hot tea into the kitchen. Which cup do you think that Kelly will take to her mother? (Point to alternatives.) Which cup was she pretending with?"

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BIOGRAPHICAL SKETCH

Wendy Seier grew up in Davenport, Iowa (which, at the time of this writing, is mostly under water). She always aspired to become a researcher in the area of psychology. She received her Bachelor of Science degree in psychology from Iowa State University, and made use of this degree to wait tables for two years before beginning graduate school at the University of Florida. She will receive her Ph. D. in the area of developmental psychology, and at this writing is eagerly looking forward to beginning her career as an Assistant Professor at Georgia Southern University.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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